PWD
1895

PROCEEDINGS

OF THE

MADRAS GOVERNMENT

IN THE

PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH,

FOR THE

MONTH OF NOVEMBER 1895.

Printed by Authority.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.
1895.

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PUBLIC WORKS DEPARTMENT.

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1 Subjects.	2 Numbers and Dates of Proceedings.	3 Date of Report to Secretary of State for India.	4 Numbers and Dates of previous Proceedings.
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1 Subjects.	2 Numbers and Dates of Proceedings.	3 Date of Report to Secretary of State for India.	4 Numbers and Dates of previous Proceedings.
	1895.		
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1 Subjects.	2 Numbers and Dates of Proceedings.	3 Date of Report to Secretary of State for India.	4 Numbers and Dates of previous Proceedings.
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Reserve stock.—The maintenance in the Gódávari Central division of a — not exceeding Rs. 1,500 in value, approved.	27th Nov., No. 1029 I.	...	......
Channel.—Estimate of Rs. 6,170 for excavating a supply — from Kattar river to Grimsa Eri tank, North Arcot district, sanctioned, and certain additions to the list of "Minor Works for which neither Capital nor Revenue Accounts are kept, Public Works Department," for the district, approved.	28th Nov., No. 1030 I.	...	......
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The above forwarded to the Government of India.	29th Nov., No. $\frac{1031}{B}$ I.	...	......
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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper:—

Progress Report, Periyár Works, for quarter ending 30th September 1895.

Main Canal.—Completed with the exception of a few barriers and caps for passing irrigation water. These will be removed when the water is let down. Maintenance and a few masonry works in progress.

Branches 1 *to* 7.—Completed. Maintenance in progress.

Branch 8.—Completed, except a small portion for which land has not been made over.

Branch 9.—Completed with the exception of a few "unforeseen masonry works."

Branch 10.—Completed with the exception of the Chunnamboor off-take, which is in progress. Some lands not yet handed over.

Branch 11.—Nil.

Branch 12.—Twenty-five chains nearly completed, the rest has not been commenced.

General.—The main canal and branches are practically completed and ready for Periyár water. "Unforeseen works," such as inlets, bridges, culverts, &c., are being and will be from time to time built. Until the "Irrigation map" is ready and until a demand has arisen for the Periyár water, it is thought inadvisable to build any more sluices or construct subsidiary channels.

It will be time enough to do this when the ryots find that an ample supply is available and make demands for the water.

At present, it is impossible to say in what direction the irrigation will develop.

For the present it will be sufficient to fill and keep full existing tanks and channels, and for this arrangements have been made.

The quarter has been a good one for work and for agricultural operations, and general prospects are good.

(Signed) J. H. MEDLICOTT,
Executive Engineer, Madura Dn.

No. 657 M.D.

Copy submitted to the Chief Engineer, Public Works Department.

(Signed) W. HUGHES,
Supg. Engineer, VI Circle.

24th October 1895.

Order.—No. 907 I., dated 1st November 1895.

Recorded and communicated to the Government of India.

[Here enter No. 908 I., dated 1st November 1895.]

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, VI Circle.
,, Chief Engineer for Irrigation.
,, Revenue Department.

Endorsement—No. 908 I., dated 1st November 1895.

Forwarded to the Government of India.

(By order.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

IRRIGATION.

Govt. of {1895} Madras..

PUBLIC WORKS.

Dated November, 1st.

Recd. *Engl.*

G.O. Nos. 907, 908 I., 1st Nov. 1895.

NOVEMBER.

Periyar Project

Forwarding Proceedings recording the progress report of works in (late No. II Division) — for quarter ending 30th September 1895.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From Lieutenant-Colonel C. C. RAWSON, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Madras, 18th August 1895, No. 257 E.I.

With reference to paragraph 35, chapter V, Volume II of the Code, I have the honour to submit for sanction and allotment of funds under the open capital account, the enclosed estimate amounting to Rs. 2,760 for constructing a drainage sluice and a foot-bridge at the infall of Nickunnam and Vickramanar drainages into Vennar, miles 58 and 58/3, respectively, in Tanjore division.

2. The necessity for the proposed work is explained in the report attached to the estimate.

3. The work is unremunerative and can be completed by December 1896.

Enclosure.

Report to accompany estimate for constructing a drainage sluice and a foot-bridge at the infall of Nickunnam and Vickramanar drainages into Vennar, miles 58 and 58/3, respectively.

	RS.
Amount of estimate	2,760

Nickunnam drainage falls into the Vennar through an open cut in the Vennar right bank, thus allowing Vennar floods to submerge 165 acres of paddy-fields. During the months of June, July and August when there is, as a rule, but little rain, but several floods in the Vennar, the seedlings get damaged by the river floods. During September, October and November, rain and river floods both combine to submerge the fields. By the construction of a drainage sluice at the mouth of the Nickunnam drainage channel, the fields will be saved the submergence during June, July and August; and it is for this purpose the sluice is proposed, though during September, October and November it will be of no benefit.

2. The Mahimalai drainage channel is already provided with a sluice.

3. The Vickramanar surplus channel also enters the Vennar through an open cut in the right bank, but this channel is double-banked throughout its whole length, and at its upper end it receives the discharges of the Kammanthangudi and Ukkadai calingulahs; the crest of these calingulahs are lower than the M.F.L. of the Vennar by 3 to 5½ feet and river-floods spread out above these works, but no great damage appears to be done. It is not proposed, therefore, to construct a drainage sluice at the mouth of the Vickramanar drainage; but a foot-bridge to connect the ends of the flood-banks.

The hydraulic calculations are given in the plan.

The work will be done as per standard specification of the Public Works Department.

(Signed) J. C. JOHNSTON,
Executive Engineer.

Order—No. 909 I., dated 1st November 1895.

The following estimate is sanctioned :—

Capital expenditure not charged to Revenue.
49. Irrigation.
Cauvery Delta System.
Open Capital Account.
4. Drainage and Protective Works.
3. Works.

Unremunerative work—

		RS.
(1) Constructing drainage sluice, Nickunnam drainage channel	...	1,490
(2) Constructing foot-bridge at the infall of Vickramanar drainage into Vennar	...	1,180
Total estimate, I. Works	...	2,670
II. Establishment	...	614
III. Tools and plant	...	16
Total	...	3,300

2. This sanction is registered as No. 123 I. of 1895–96 and will expire on the 31st March 1897.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 910 I., dated 1st November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle, with five enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

Endorsement—No. 910 I., dated 1st November 1895.

Forwarded.

(By order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Secretary to the Government of India,
Public Works Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 1st.

Recd. *Encl.*

G.O. Nos. 909, 910 I., 1st Nov. 1895.

NOVEMBER.

Cauvery Delta System

Forwarding Proceedings sanctioning estimates aggregating Rs. 3,300 for constructing a drainage sluice and a foot-bridge at the infall of Nickunnam and Vickramanar drainages into Vennar.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From A. S. Russell, Esq., Officiating Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated 25th October 1895, No. 25 C.

With reference to your telegram, dated 9th instant, I have the honour to report that the additional grant of Rs. 73,000 sanctioned for the Kistna delta under 42. Revenue Account is required for the upkeep of the main canals and distributaries both in the Kistna Eastern and Western divisions, and for paying off the dues for the repair works already done before the re-opening of the canals to prevent loss of revenue. It is not possible to give any figures of what this loss of revenue would have amounted to, were such repairs not executed.

2. The number of distributaries to be maintained is annually increasing, owing to the extension of irrigation in the delta, and an increase of revenue will be derived therefrom, as also an increased outlay for maintenance.

3. I request the additional grant of Rs. 73,000 may be distributed as noted in the margin for the Kistna Eastern and Western divisions.

42. Major Works (Working Expenses).	RS.
Kistna Eastern division	25,000
Do. Western do.	34,350
Establishment charges	13,650
Total ...	73,000

4. The Executive Engineer, Kistna Eastern Division, has just applied, in addition to the above, for an additional grant of Rs. 20,000 under 42. Revenue Account for closing the breaches caused by the floods of the 5th September 1895. This amount is absolutely necessary, the breaches having already been closed on emergency, as otherwise the crops over the main portion of the Eastern delta would have been entirely lost.

No. 199 I.

Submitted to Government with reference to paragraph 3 of G.O. No. 827 I., dated 9th October 1895.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

29th October 1895.

Order—No. $\frac{914}{A}$ I., dated 1st November 1895.

The following deferred telegram will be sent:—

To the Secretary to the Government of India.

"Your telegram 68 A.I., 1st instant. Rs. 73,000 already applied for under 42, Kistna delta, required for settling dues for repairs done before canal re-opening to avert loss of revenue. Not possible to estimate what loss would be were repairs not executed. Further grant Rs 20,000 absolutely needed to cover emergent outlay on closing breaches caused by September floods. Please wire sanction to additional grant Rs. 93,000."

2. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. $\frac{914}{B}$ I., dated 1st November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

Endorsement—No. $\frac{914}{B}$ I., dated 1st November 1895.

Forwarded.

(By order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Secretary to the Government of India,
Public Works Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 1st.

Recd. *Encl.*

G.O. Nos. $\frac{914}{A}$, $\frac{914}{B}$ I., 1st Nov. 1895.

NOVEMBER.

Kistna Delta System

Forwarding Proceedings directing that a telegram be sent to the Government of India requesting sanction, by wire, to an additional grant of Rs. 93,000 under "42,"—.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From G. D. WYBROW, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 1st June 1894, No. 486 G.D.

At the request of the Executive Engineer, Gódávari Eastern Division, in his letter No. 66 S. of 18th April 1894, I have the honour to forward his letter No. 1 S. of 23rd March 1894, for your consideration. His plea for further extension of wet cultivation has been settled, as you have sanctioned in your Memo. No. I/44 G.D. of 21st April 1894, the following ultimate areas :—

	ACS.
Eastern delta	195,000
Central „	130,000
Western „	350,000
Total ...	675,000

2. The Executive Engineer is mistaken in what he says in paragraph 1 of his letter, as on the receipt of your Memo. No. I/120 G.D. of 27th October 1892, he was informed that the ultimate area of the Eastern delta would stand at 186,020 acres or 4,075 acres in excess of the last return in which the area of wet cultivation is shown as 181,945 acres.

3. Regarding the question of raising the anicut, I am not personally in favour of so doing, and I do not consider that the Executive Engineer (Mr. Ussher) has proved the actual necessity for so doing. After the re-opening of the canals, previous to the rise of the river in June, there is no doubt that great difficulty occurs in supplying water for seed beds and for navigation, but when once the river was come in fresh, all difficulty is at an end. The loss in the delta from want of water is, I believe, inappreciable, but there is no denying that the loss of crop is considerable from an excess of water.

4. Considering the raising of the anicut from an engineering point of view, I am dubious about the wisdom of raising it. The present work has answered admirably, and it would be a pity to strain it further. The formation of shoals would probably be largely increased. It is now a matter of considerable difficulty to keep the head of the Central delta open, but if the anicut was raised, the head of the Central delta would be almost completely choked up with sand, I believe.

5. If, however, you should consider that the raising of the anicut should be carried out at some future date when the necessity for so doing is apparent, I would recommend that the section of the anicut given by Mr. Ussher be adopted. The raising could, of course, be more cheaply carried out by the erection of a small wall with a top breadth of 3 feet and a bottom breadth of 4 feet. The water, however, would not flow freely over such a section, and the surface of the old crest and of the counter-slope would be liable to damage.

ENCLOSURES.

From C. J. USSHER, Esq., Executive Engineer, Gódávari Eastern Division, to the Superintending Engineer, I Circle, dated Dowlaishweram, 23rd March 1894, No. 1 S.

Ultimate area of Irrigation.—I have the honour to bring to your notice that the ultimate areas to be irrigated by the canals of this division have not yet finally been decided, and that in consequence, difficulty is experienced and in dealing with applications received from the Revenue

Department for conversion of dry lands into wet. With this office No. 295 S., dated 26th July 1892, my predecessor submitted a statement of proposed ultimate areas aggregating to 201,000 acres, but this was subsequently revised by your orders and a statement amounting to 186,000 acres was submitted by Mr. C. M. Smith, with this office No. 692 S., dated 21st January 1893.

2. *Area of land still available for Irrigation.*—I have instituted enquiries regarding the area of land still available for irrigation, which is suitably situated and which the ryots desire to cultivate wet. I find that the area of this land amounts to about 12,000 acres exclusive of the Coringa Island, for the irrigation of which water would have to be taken under the Coringa branch of the Gódávari river. In the Coringa Island 5,000 or 6,000 acres might be irrigated and if you consider it desirable the best means of doing so will be investigated.

3. *Proposed ultimate area.*—According to the latest reliable irrigation accounts (which are those furnished by the Revenue Department for fasli 1301), the area irrigated by the canals in this division amounted to close on 182,000 acres (181,945) but it is probable that since that fasli there has been an increase to the extent of not less than 1,000 acres. I therefore propose that the ultimate area for this division should be 195,000 acres distributed under the various canals as shown in enclosure No. I or 200,000 acres, if provision is to be made for Coringa Island.

4. *Duty of water and discharge of main canal.*—In the Kistna delta very considerable extensions of irrigated area are about to be carried out, and the duty of water for canals in that delta has been settled at 1 cubic foot per second for 89 acres. There is, I presume, no reason why the same duty of water should not be taken for the Gódávari delta; but so far as this division is concerned, so high a duty is not required, because land is not available.

The discharge of the main canal at F.S.L. is according to the figures entered in Colonel Mullins' note printed with G.O. No. 259 I., dated 21st March 1882, 2,826 cubic feet per second; and recent actual observations tend to confirm the accuracy of these figures. At a duty of 1 cubic foot per second for 89 acres, the total irrigated area would be 251,514 acres. But as there is much land commanded by the Bank canal, which the ryots will not cultivate wet, it is as already stated, very improbable that more than 195,000 acres will be brought under irrigation and for that area the duty of water passed down the main canal at F.S.L. would be 69 acres only. It would therefore appear that there is no reason why the area under irrigation in this division should be restricted; but there is an important matter which requires consideration in this connection, viz., the level of the anicut crest.

5. *Gódávari river.*—Enclosure No. II is a statement showing the number of days per month during 33 years (1860 to 1892) on which there was a depth of over 0 and 1, 2 and 3 feet on the anicut crest from June to October. For the months of June and July the average number of days on which 2 feet — 3 feet passed over are as follows:—

June	2 feet 3 days	3 feet 1·2 days
July	2 feet 20·8 days	3 feet 15·6 days

The average date upon which water first passes over the anicut may be taken as 18th June. A depth of 0·2 feet passing over the anicut is calculated to amount to a discharge of approximately 3,300 cubic feet per second which would be about the quantity of water required to raise the water levels in the three main canals by 2 feet. If, therefore, the anicut crest was raised from 6 feet to 8 feet above the sills of head sluices a depth of about 8 feet might be counted on in the month of June for 12 days on the average in each year, and during the whole of July F.S.L. could be sent down the canals except in very abnormal years.

A reference to enclosure No. II will show that as matters now are the average number of days on which F.S.L. can be sent down the canals are in June about 1½ days and in July about 16 days and that for no month throughout the irrigation season can F.S.L. be counted on with any certainty during the whole month.

6. *Anicut.*—The anicut crest is formed of roughly cut Dowlaishweram sand stone to a great extent, and also some stone of harder and better quality; but the soft stone largely preponderates. The action on the crest during the past 37 years of flood water heavily charged with sand is very apparent and the stones have been largely worn away and holes scoured, which, from time to time, have been filled with pebble concrete or other material, but all such work is of a temporary nature and it will undoubtedly be necessary in the not distant future to renew 75 per cent. of the crest with stone of superior quality from Yerrampalem quarry. The wear and tear of the crest is further increased by the obstruction caused by the cast iron anicut posts now in use for holding up water after the flood season.

If, therefore, it should be considered that in the interests of the delta the time has now arrived when the anicut crest should be permanently raised, the cost of largely renewing the existing crest should be set off against the cost of raising the crest level.

7. *Raising the Anicut.*—The approximate cost of raising the crest 2 feet to section shown in enclosure III would be Rs. 1,58,000 with the best stone procurable in the neighbourhood. It has been calculated by Mr. Lacey, Assistant Engineer, that the afflux above the anicut which would be caused by raising the crest 2 feet would amount to 0·15 feet during maximum flood on

the Dowlaishweram and Maddoor branches, and 0·3 feet on the Vizesweram branch. Owing to the position of the gauges any calculations for the Ralli branch are unreliable, but it is probable that the afflux on this branch would not exceed that on the Vizesweram branch.

8. *Western and Central Deltas*—The discharges of the Western and Central delta main canals are as follows (*Vide* Colonel Mullins' notes, G.O. No. 259 I., dated 21st March 1882) :—

	C. FT. PER SEC.
Western delta	3,945
Central "	1,745
Total ...	5,690

Taking the duty of water for cubic feet per second to be 89 acres, the area to be irrigated in these deltas would be 506,410 acres. According to a statement printed with G.O. No. 259 I, dated 21st March 1882, the areas commanded by the canals in Western and Central deltas are—

	ACS.
Western delta	417,513
Central "	165,800
Total ...	583,331

and the gross areas of those deltas are—

	ACS.
Western delta	659,200
Central "	323,200
Total ...	982,400

If, therefore, the area to be irrigated in these two deltas is taken at 506,410 acres, it would be 77,000 acres less than the area said to be commanded by the canals and only 55 per cent. of the gross areas of the deltas, whereas the area that is now proposed and can be irrigated in the Eastern delta is 68 per cent. of the gross area of that delta.

I am, of course, not in a position to know to what extent irrigation can be extended in the Central and Western deltas, but I understand that there is room for considerable extension, and I have briefly touched on the subject, because it has an important bearing on the question of raising the anicut crest for, if irrigation is to be largely extended, it becomes essential that we should be able to maintain F.S.L. in the main canals during the irrigation season. In conclusion I may point out that the water-tax for one year on an extension of 40,000 acres would repay the cost of raising the anicut crest.

From C. J. USSHER, Esq., Executive Engineer, Gódávari Eastern Division, to the Superintending Engineer, I Circle, dated Dowlaishweram, 18th April 1894, No. 66 S.

With reference to this office No. 1 S. regarding the extension of Irrigation and bringing forward, for consideration in connection therewith, the question of the advisability of raising the level of the anicut crest, I have the honour to point out that in the event of its being considered desirable to raise the anicut crest, the preparation of materials for next year's work should be commenced as soon as possible. The question is one, which, I submit, should be considered in connection with any proposed large extension of irrigation ; and I have to request that you will be so good as to forward my letter, together with its enclosures, and any remarks you may think fit, to the Chief Engineer for Irrigation.

Enclosure No. I showing original Project areas, Eastern Division, actual area under cultivation, first crop, fasli 1301, and areas now proposed under each canal.

—	Original project area.	Revised project area.	Actual fasli 1301.	Areas now proposed.
	ACS.	ACS.	ACS.	ACS.
Bank canal	40,399	20,000	26,197	33,000
Coringa canal	32,257	32,000	32,555	33,000
Injeram "	16,897	16,800	15,128	16,000
Cocanada "	38,761	44,000	43,636	44,000
Mandapetta canal	32,155	28,000	31,517	32,300
K. Manjair "	..	..	3,361	7,100
Samulcottah "	27,701	29,000	29,551	29,600
Total ..	188,170	170,000	181,945	195,000

Enclosure No. II—Statement showing average number of days in each month (June—October) on which water was at or over 0 and 1, 2 and 3 feet from 1860 to 1892.

Year.	June.				July.				August.				September.				October.			
	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
	Feet above crest.																			
1860	3	1	..	..	23	22	12	3	31	31	26	20	30	30	28	19	26	9	4	..
1861	17	9	..	..	31	31	23	18	31	31	26	22	30	30	19	15	31	12	5	2
1862	..	..	..	..	26	10	..	..	31	31	25	17	30	27	22	10	31	26	13	8
1863	10	1	..	..	31	26	14	5	31	31	25	20	30	30	24	21	31	8	..	..
1864	4	2	..	..	31	29	14	12	31	31	18	4	30	30	30	17	31	13	..	..
1865	13	2	..	..	30	30	27	18	31	31	31	31	30	30	30	29	31	31	27	..
1866	4	2	..	..	31	29	18	9	31	31	31	31	30	30	30	28	31	31	14	..
1867	10	8	6	1	31	31	18	11	31	31	31	28	30	30	30	27	31	31	29	15
1868	22	11	5	3	31	17	12	4	31	31	24	18	30	30	..	..	31	31	..	..
1869	12	5	2	..	31	31	15	7	31	31	31	18	30	30	30	23	31	31	20	15
1870	9	8	5	4	31	31	23	16	31	31	29	16	30	30	30	11	31	31	31	11
1871	10	8	8	2	31	31	19	11	31	31	24	12	30	30	22	13	31	31	20	4
1872	6	5	4	4	31	31	31	31	31	31	31	31	30	30	30	30	31	31	30	14
1873	16	..	..	..	31	25	17	4	31	31	19	10	30	30	29	22	31	31	12	..
1874	17	14	10	1	31	31	20	13	31	31	31	31	30	30	30	30	31	31	18	3
1875	11	9	7	1	31	31	29	25	31	31	31	30	30	30	30	30	31	31	24	8
1876	5	..	..	..	31	22	14	9	31	31	23	10	30	30	30	23	31	31	7	..
1877	11	1	..	..	31	26	11	7	31	31	25	20	30	30	30	16	31	31	31	2
1878	..	..	..	..	31	31	27	25	31	31	31	31	30	30	30	30	31	31	29	14
1879	30	22	7	3	31	31	20	10	31	31	31	30	30	30	30	23	31	31	26	16
1880	3	..	..	..	31	29	28	26	31	31	31	26	30	30	30	27	31	31	28	11
1881	17	12	4	..	31	28	27	26	31	31	31	27	30	30	30	23	31	31	26	13
1882	19	18	11	..	31	27	25	21	31	31	31	20	30	30	30	25	31	31	16	6
1883	14	14	5	3	31	31	31	31	31	31	23	90	30	30	30	30	31	31	31	26
1884	4	2	..	..	31	31	26	21	31	31	31	28	30	30	30	30	31	31	31	13
1885	12	9	9	8	31	31	19	15	31	31	31	31	30	30	30	18	31	31	25	7
1886	24	8	6	5	31	31	31	29	31	31	31	21	30	30	27	15	31	31	31	23
1887	17	16	5	2	31	31	28	26	31	31	31	31	30	30	30	25	31	31	31	6
1888	7	..	..	..	31	20	26	17	31	31	27	25	30	30	29	9	31	31	22	..
1889	17	1	..	..	31	27	19	11	31	31	31	30	30	30	30	30	31	31	31	20
1890	17	13	8	4	31	31	31	27	31	31	31	31	30	30	30	20	31	31	26	8
1891	..	..	..	..	24	15	11	10	31	31	31	25	30	30	30	30	31	31	28	16
1892	21	8	..	..	31	31	22	18	31	31	31	31	30	30	30	30	31	31	31	9
Average for 33 years.	11·6	6·3	3·0	1·2	30·0	27·8	20·8	15·6	31·0	31·0	28·3	23·1	30·0	29·9	27·8	22·0	30·8	28·3	21·1	8·1

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 29th August 1894, No. 1076 G.D.

I have the honour to submit a copy of Mr. Paul's report on the proposed raising of the anicut crest, as requested in your memo. No. 1/62 G.D. of 11th June 1894.

2. I think the correspondence which has taken place on this important subject clearly shows that, for numerous reasons, it would be extremely desirable to make the anicut 2 feet higher than it is at present.

3. Mr. Ussher's approximate estimate of the cost of the work amounts to Rs. 1,58,000, but he points out that, at no distant date, it will be necessary to renew about 75 per cent. of the present crest stones, the cost of which should be deducted from amount of his estimate in order to arrive at the extra outlay involved by raising the anicut crest 2 feet.

4. Accepting this view it would only take about Rs. 40,000 more to raise the crest than it would to carry out the repairs which will shortly have to be undertaken.

5. It may, I think, be taken for granted that the increase in the cultivated area rendered possible by the raising of the crest would be at least 20,000 acres, so that the work can be strongly recommended from a financial point of view.

6. It only remains to consider whether the raising of the crest will be attended with danger to the anicut itself or the head works in connection with it.

7. Mr. Wybrow has given his opinion that it would be unwise to raise the anicut because the work would be too severely strained. So far from taking this view I consider that by raising the crest 2 feet for its whole width and getting rid of the objectionable iron posts, the work would be made safer than it is at present. I should mention that the recent examinations of the anicut and its aprons show that the work suffers very little damage indeed. A portion of the crest is already more than 2 feet higher than the general level and the apron below this raised part shows no sign of extra wear and tear.

8. The afflux caused by the raising is insignificant and would necessitate no alteration in the head works.

9. The most important point for consideration and the one on which the whole question must turn is the effect the raising would have on the formation of shoals above the anicut.

10. It will be observed from Mr. Paul's letter that the supply to the Central delta is already seriously affected by the formation of shoals in the river, and it is certainly possible that raising the anicut might aggravate the present difficulty.

11. From the experience gained from the raising of the crest in 1861–62 it ought to be possible to predict the result of the further raising proposed, but I regret to say I can find nothing on record to show what effect was produced by the raising in 1861–62.

12. As regards the difficulty experienced in supplying the Central delta, I am of opinion that the training work in front of the head-sluice is defeating the object it was intended to serve.

13. If the whole of the eastern spit was removed the Central delta would receive a far better supply than now reaches it, and the inference to be drawn appears to be, that training works of the kind in question, though beneficial at one time, may become quite the reverse at another, and that it is necessary to be continually changing our tactics to suit the altered conditions of the river bed.

14. The tendency of the river to form shoals must always be a source of trouble, but there are, I believe, no grounds for assuming that the shoaling will become so much worse if the anicut is raised as to outweigh the great advantages which will attend the raising.

15. Personally I am in favour of undertaking the work and not relinquishing the assured benefits which would result from such a course for fear of consequences which are more or less problematical and at their worst would not be irremediable.

ENCLOSURES.

From J. E. PAUL, Esq., Executive Engineer, Gódávari Western Division, to the Superintending Engineer, I Circle, dated Chettipett, 11th August 1894, No. 251 S.

[*Reference*—your No. 619, dated 22nd June 1894, on Chief Engineer for Irrigation's No. 1/62 G.D., dated 11th June 1894.]

I have the honour to state that I consider that the proposal made by Mr. Ussher to raise the crest of the Gódávari anicut 2 feet would be, as far as the Western delta is concerned, most highly beneficial and a very remunerative work.

2. The defect in the irrigation of the Western delta is that it is not possible to get sufficient water in the critical time, when transplantation is in progress, or between June 15th and July 15th. Early transplantation is of paramount importance in this delta on account of the fact that a large area of the rice cultivation is on a very low-level, and if not transplanted early in the year, the crops are unable to withstand the submergence to which they are liable in the month of September. I enclose a statement which will show at once the number of days in this period when water is running to waste over the anicut.

3. The advantages that would be gained by raising the anicut are—

(i) that the low and poor lands could be transplanted earlier and be consequently more able to withstand damage from submergence and by blight ("kodu"); both of these are the cause of much loss in this delta. The blight is caused by the winds of September and October and affects mostly the weak plants that have been transplanted late;

(ii) that labour could be obtained with greater facility and cheaper; at present all wish to obtain labour as soon as the floods come down, and so there is at that time great competition and the wages given are often very high;

(iii) Besides these important advantages, I believe a rapid increase in the irrigated area would be caused. I enclose a statement showing the area effectually irrigated from 1882 to 1892. The sudden decrease in 1883 was chiefly due to the destruction of crops by the Yerracalva floods of 1882 which, the figures show, threw back the growth of irrigation in the Western delta for two years. This fact, I may parenthetically state, shows the necessity of the Anumallanka project as a flood regulator for the delta independently of its use for irrigation. With this exception, the growth in the Western delta has been constant, and I believe will soon reach 350,000 acres, probably about the acreage of the land that can be for many years irrigated with profit in this delta.

As regards the Central delta, there is of course the possible objection that the raising of the crest might prejudicially affect the supply of that delta by increasing the blocking up the entrance by shoals. This is a difficult point and especially, as I have not the anicut charts, I do not feel competent to offer any opinion. The present state of this entrance, however, is already so serious that very little water was received this year into this delta until the later floods come down.

The statement of the acreages annually irrigated in this delta that I enclose will show a rapid decrease since 1891 and the necessity for immediate attention to the improvement, if possible, of the approach to this delta.

STATEMENT of areas effectually irrigated from 1882–83 to 1892–93, Western Delta.

Years.	Area effectually irrigated, 1st crop.	Average showing estimated growth as given in G.O., No. 259 I., dated 21st March 1881.	Remarks.
	ACS.	ACS.	
1880-81	..	300,017	
1882-83	* 281,446	..	* As per Delta Superintendent's figures as Revenue information has not been published by deltas for this year.
1883-84	271,803	302,017	
1884-85	283,048	306,017	
1885-86	304,972	311,017	Area commanded (*vide* G.O., No. 259 I., dated 21st March 1881). ACS. 417,531
1886-87	311,246	317,017	
1887-88	320,461	319,563	Gross area (*vide* G.O., No. 259 I., dated 21st March 1881). 1,267,200
1888-89	323,534	..	Ultimate area, provisional (*vide* Chief Engineer for Irrigation's, No. 44 dated 21st April 1894). 350,000
1889-90	328,375	..	
1890-91	334,994	..	
1891-92	342,036	..	
1892-93	339,296	..	

Statement showing the number of days with depths of water over anicut during the periods 15th to 30th June, 1st to 15th and 16th to 31st July of each year from 1867 to 1894.

Years.	Number of days water over anicut, 15th to 30th June.			Number of days water over anicut, 1st to 15th July.			Number of days water over anicut, 16th to 31st July.		
	Less than 1 foot.	1 foot or more.	2 feet or more.	Less than 1 foot.	1 foot or more.	2 feet or more.	Less than 1 foot.	1 foot or more.	2 feet or more.
1867	1	2	7	0	8	7	0	4	12
1868	3	8	5	14	1	0	0	4	12
1869	7	2	3	1	11	3	0	4	12
1870	1	1	7	0	8	7	0	0	16
1871	0	0	7	0	10	5	0	0	16
1872	0	1	4	0	0	15	0	0	16
1873	16	0	0	4	3	8	0	4	12
1874	0	6	9	0	12	3	0	0	16
1875	3	2	6	0	3	12	0	0	16
1876	2	0	0	8	6	0	1	7	8
1877	3	1	0	1	10	4	1	7	8
1878	0	0	0	0	5	10	0	0	16
1879	5	7	4	0	5	10	0	12	4
1880	2	1	0	0	3	12	0	0	16
1881	3	7	6	3	2	10	0	0	16
1882	0	7	9	1	5	9	0	0	16
1883	0	9	5	0	0	15	0	0	16
1884	1	2	0	0	6	9	0	0	16
1885	3	1	8	0	9	6	0	0	16
1886	6	4	6	0	0	15	0	0	16
1887	0	10	6	0	1	14	0	0	16
1888	6	0	0	1	4	10	0	0	16
1889	13	3	0	4	7	4	0	0	16
1890	4	4	8	0	0	15	0	0	16
1891	0	0	0	3	5	0	1	4	11
1892	7	8	1	0	9	6	0	0	16
1893	4	1	11	0	6	9	0	0	16
1894	3	7	2	5	8	2	0	0	16

Statement of areas effectually irrigated from 1882–83 to 1892–93, Central Delta.

Years.	Area effectually irrigated, 1st crop.	Average showing estimated growth as given in G.O., No. 259 I., dated 21st March 1881.	Remarks.	
	ACS.	ACS.		ACS.
1880–81	..	97,670		
1882–83	89,784 *	..	* As per Delta Superintendent's figures as Revenue information has not been published by deltas for this year.	
1883–84	93,867	101,670		
1884–85	93,900	109,670		
1885–86	98,588	114,670	Area commanded (*vide* G.O., No. 259 I., dated 21st March 1881).	165,800
1886–87	100,147	118,670		
1887–88	108,359	121,020	Gross area commanded (*vide* G.O., No. 259 I., dated 21st March 1881).	323,200
1888–89	117,040	122,420	Ultimate area provisional (*vide* Chief Engineer for Irrigation's No. 44 G.D., dated 21st April 1894).	130,000
1889–90	119,962	..		
1890–91	121,944	..		
1891–92	117,049	..		
1892–93	115,527	..		

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 9th September 1895, No. 1300 G.D.

I have the honour to submit the estimate called for in your memo. No. I/76 G.D. of 31st July 1895.

2. You will observe that a stone wall has been allowed in rear as well as in front, as I do not see how it is possible to make a good job of the curved edge (*vide* your section herewith) in rear, unless specially moulded concrete blocks were made, and this would be as expensive as the stone now allowed.

3. Mr. Ussher proposes that the bottom course of the raising should be of large sized dressed faces backed with rubble and I have no objection to offer to this.

4. Mr. Ussher is also of opinion that we should try and complete the raising of one anicut first instead of raising all the anicuts one foot. This apparently was the course followed when the anicut was raised many years ago, and as it would simplify work, it might be tried again, though I am in favour of the one foot raising.

5. With regard to Mr. Ussher's remarks about stone instead of concrete (*vide* copy of his No. 370 S., dated 24th August 1895, herewith sent), the question may be left open till we see how the experimental work in concrete has answered.

Enclosure.

Copy of letter from the Executive Engineer, Gódávari Eastern Division, to the Superintending Engineer, I Circle, dated 24th August 1895, No. 370 S.

Referring to your endorsement No. 1085 G.D., dated 14th August 1895, on Chief Engineer for Irrigation's memorandum No. I/76 G.D., dated 31st July 1895, I have the honour to submit herewith a fresh estimate, amounting to Rs. 1,08,000, for raising the crest of Gódávari anicut to + 40·0 M.S.L. prepared as per your instructions, for your approval and transmission to the Chief Engineer for Irrigation.

2. In forwarding this estimate I trust I may be permitted to place on record that in my opinion the method of raising originally proposed (*i.e.*, forming crest of hard gneiss) is far preferable to a concrete crest. It is true that the latter method is considerably cheaper and that the work can be more expeditiously done; but I submit that both of these reasons are of very small consequence, compared with obtaining the best and most durable crest possible.

3. As regards the work which can be done next season under the estimate now submitted, there is some difficulty in estimating the quantity, because it is necessary to acquire and open up the quarry at Purushottapatam. Dressed stone will be the cause of delay and a large quantity of this is required owing to the proposed section of the rear wall. I believe that the crests of the various branches of the anicut, when raised in the early sixties, were each raised full 2 feet and that it took four seasons to complete the work. It would facilitate work, if the same course were followed now and each crest raised the full 2 feet at one time.

4. The estimate provides for forming the front and rear walls of dressed stone throughout their thickness. This is, I think, hardly necessary and the bottom course might be of large-sized dressed faces backed with rubble.

No. 198 I.

Submitted to Government with a recommendation that the estimate be forwarded for the sanction of Government of India with reference to paragraph 35 V (*b*), chapter V, volume II, Public Works Code.

2. At the present time water-level in front of the Gódávari anicut during certain months in the year is maintained at + 40·00 by means of shutters, 2 feet high, supported by iron standards. This arrangement is unsatisfactory, as the leakage is, of necessity, considerable and the mere placing in position of such a number of shutters is, in itself, a work which takes a considerable time; further, as the shutters cannot be fixed until water has fallen almost to crest level, a considerable waste of water results.

3. The ultimate area of irrigation in the Gódávari delta was last year increased from 640,000 to 675,000 acres and a further increase of at least 20,000 acres is considered feasible. To ensure this large area of irrigation an adequate supply of water at the commencement and end of the cultivation season, it is proposed to raise the anicut crest permanently from + 38·00 to + 40·00, or to the level of the top of shutters mentioned in paragraph 2 *supra*, at a cost of Rs. 1,33,000 including establishment, &c., charges.

4. As pointed out by the Executive Engineer, Gódávari Eastern Division, the present crest of the anicut is largely formed of roughly cut Dowlaishweram sand stone and during the last 37 years has become much worn. A large expenditure on renewing this crest will therefore in any case be necessary.

5. During a maximum flood it is calculated that the extra afflux due to the raising of the anicut will be inappreciable; but during moderate freshes, the difference of water-level in front and rear and consequently the velocity will be increased. The raising will, therefore, it is believed, not affect prejudicially the entrance to the Central delta, as suggested by the Executive Engineer, Gódávari Western Division, but may rather improve it. No alteration to head works will be required owing to the small increase in M.W.L., but provision has been made in the estimate for raising the connecting banks between the anicuts which should be maintained at the height above M.W.L. fixed by Mr. Walch when Superintending Engineer of the I Circle.

6. An experimental length of 50 feet of the anicut crest was raised during the current year. In carrying out the work the section shown on the plans should be adhered to, if it be found that, at the end of the season, the concrete of the experimental portion has stood well. Until this experimental length has been tested it is useless to discuss different sections.

7. The work is a most highly beneficial and very remunerative one. An application has already been submitted for an allotment of Rs. 10,000 for the collection of materials during the current year in view to advantage being taken of the next working season.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

25th October 1895.

Order—No. 917 I., dated 2nd November 1895.

The estimate, amounting to Rs. 1,33,000 as shown in the margin, for raising the crest of the Gódávari anicut by 2 feet, is approved.

Gódávari Delta System,
Eastern Division.
I. Head Works.
2. Works.

		RS.
I.	Works	1,08,000
II.	Establishment	24,380
III.	Tools and plant	620
	Total estimate	1,33,000

2. The attention of the Superintending Engineer, I Circle, is drawn to paragraph 6 of the foregoing endorsement of the Chief Engineer for Irrigation.

3. Ordered that a copy of these Proceedings, together with the estimate for the work, be forwarded to the Government of India with a request that early sanction may be accorded to the proposed raising of the anicut crest under "49. Capital expenditure not charged to Revenue," Gódávari System, Open Capital Account.

[Here enter No. 918 I., dated 2nd November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

ENDORSEMENT.—No. 918 I., dated 2nd November 1895.

Forwarded.

(By order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O. Nos. 917, 918 I., 2nd Nov. 1895.

NOVEMBER.

Godavari Anicut

Forwarding Proceedings approving the estimate of Rs. 1,33,000 for raising the crest of the — by 2 feet, and requesting early sanction to the same.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 29th August 1895, No. 1200 G.D.

I have the honour to submit herewith, for sanction, an estimate amounting to Rs. 1,360 under capital account for excavating Indupalli drain in the Central Delta Sub-Division, Gódávari Western Division.

2. The necessity for the excavation of the drain is fully explained in the report accompanying the estimate.

3. The work will be completed before the close of the current official year, if funds are allotted at once.

4. Longitudinal and cross sections of the drain and a sketch from the village map showing the proposed line of the drain are also forwarded.

To the Superintending Engineer, I Circle, dated 9th September 1895, No. 94 G.D.

From W. J. HOWLEY, Esq., Assistant Engineer, Gódávari Central Division, to the Superintending Engineer, I Circle, dated Dowlaishweram, 28th September 1895, No. 62 S.

In returning herewith the enclosures received with your Endorsement No. 1381 G.D., dated 17th September 1895, I have the honour to state that the spouts referred to in the report have hitherto been found totally insufficient to discharge even the ordinary drainage after heavy rain; and that at such times the canal bank (now Vaniteyam right bank) has invariably been breached near the 33rd mile stone, with the result that not only was a large quantity of silt washed into the canal, but other breaches were always caused to the canal *left* bank in order to let out the excess water that Bodasakurru surplus weir could not possibly discharge.

2. There is an error in the report regarding the area of land to be drained by the proposed channel. The catchment area is almost entirely cocoanut garden, and hence it is difficult to fix its exact boundaries; it is, however, roughly about half a square mile, the 50 acres mentioned in the report being the area of land *that suffers damage* from the absence of proper drainage.

3. A masonry inlet is impracticable, as after a high flood it would have to discharge in a day or two water lying 6 feet deep all over the low lands affected, the depth gradually decreasing all round towards the high ground. Moreover, a masonry inlet at this place would necessitate a corresponding outlet somewhere near Bodasakurru surplus weir; and the cost of *either* masonry work would exceed the cost of the proposed drain.

4. The proposed drain will not join the canal. It will tail into the existing Vakálagaruvu drain which flows along parallel to, and outside, the flood embankment, and finally discharges into the river near the village of Vakalagaruvu.

ENCLOSURE.

REPORT to accompany estimate for excavating Indupalli drain.

At the 33rd mile stone, Bendamurlanka canal, there are two drainage spouts in the canal right bank which is also a flood embankment. These spouts are naturally a source of very great danger to the bank during floods. The area of land drained by the spouts is about 50 acres. These 50 acres are low-lying and surrounded on all sides by a ridge of high ground. After a flood in the river has gone down the water lies in this depression and its only outlet is into Bendamurlanka canal by means of these two spouts. The consequence was that the bank almost always breached or was cut by the ryots on such occasions.

The Superintending Engineer in his inspection notes, dated 22nd March 1894, ordered the removal of these spouts and the excavation, through the ridge of high land, of a small drain to replace them. An estimate for the latter is, therefore, herewith submitted.

The drain will have 3′ bed width, side slopes $1\frac{1}{2}$ to 1, and bed fall 2′ per mile. The banks are merely spoil banks and are otherwise unnecessary. The level of the lowest lands to be drained is + 7·00.

The actual earthwork of the drain will cost only Rs. 210; but as it has to pass through valuable cocoanut gardens, the compensation to be paid brings the total of the estimate up to Rs. 1,360.

It is proposed to name the drain "Indupalli drain."

No. 1563 G.D.

Copy submitted to the Chief Engineer for Irrigation with reference to his No. 1/94 G.D., dated 9th September 1895.

It is regretted that the original report was not made clearer as it was not intelligible to any one unacquainted with the locality.

(Signed) A. H. GARRETT,
Superintending Engineer, I Circle.

10th October 1895.

No. 202 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

31st October 1895.

ORDER—No. 919 I., dated 2nd November 1895.

The following estimate is sanctioned :—

Capital expenditure not charged to Revenue.
49. Irrigation.
Gódávari Delta System.
Open Capital Account.
Central Section.
4. Drainage and Protective Works.
Unremunerative Work.
Indupalli Drain.
2. Land.

	RS.	RS.
1. Compensation for land and trees	1,100	1,100
4. Earthwork.		
2. Excavating drain	210	210
5. Miscellaneous.		
3. Demarcation stones	50	50
Total, I Works ...		1,360
II. Establishment ...		60
Total, Estimate ...		1,420

2. This sanction is registered as No. 124 I. of 1895-96 and will expire on the 31st March 1897.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 920 I., dated 2nd November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, 1 Circle, with seven enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

Endorsement—No. 920 I., dated 2nd November 1895.

Forwarded.

(By order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O. Nos. 919, 920 I., 2nd Nov. 1895.

NOVEMBER.

Indupalli Drain

Forwarding Proceedings sanctioning an estimate of Rs. 1,420 for excavating —, Gódávari Delta system.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From N. F. MACKENZIE, Esq., Under Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Simla, the 23rd October 1895, No. 259 I.

I am directed to acknowledge the receipt of the Proceedings of the Government of Madras, No. 772 I., dated the 20th September 1895, copy forwarded under your No. 773 I. of the same date, approving of a revised estimate, amounting to Rs. 29,100, for constructing a regulator of nine vents across the Vettar, just below the offtake of the Odamboghiar, Cauvery delta system, and requesting the sanction of the Government of India thereto.

2. I am to communicate the formal approval by the Government of India of the revised estimate, and to point out that under the rules contained in Public Works Department Code, Volume II, chapter V, paragraph 35, clause V (*c*)—*vide* Standing Order No. 11, dated 30th November 1894,—the revised estimate in question is within the powers of the Government of Madras to sanction.

The revised estimate and the plans received with the Madras Government Proceedings under acknowledgment are returned herewith.

ORDER—No. 921 I., dated 2nd November 1895.

Communicated to the officers concerned with reference to G.O. No. 772 I., dated 20th September 1895.

2. This sanction is registered as No. 125 I. of 1895-96 and will expire on 31st March 1898.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle, with four enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.
,, Marine Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O. No. 921 I., 2nd Nov. 1895.

NOVEMBER.

Regulator

Letter from the Government of India communicating their formal approval of the revised estimate of Rs. 29,100 for constructing a — of nine vents across the Vettar, just below the offtake of the Odamboghiar, Cauvery delta system, communicated to officers concerned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—again the following paper :—

G.O. No. 654 I., dated 14th August 1895.

Read—also the following papers :—

From C. H. T. NORFOR, Esq., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 6th September 1895, No. 1840.

With reference to G.O. No. 654 I., dated 14th August 1895, I have the honour to report as follows :—

1. *Paragraph* 7 *of Board's Proceedings* recommending that the canal should be closed for six weeks only. There is nothing to be gained by this. It would involve increase of cost of silt clearance, inasmuch as the silt would have to be removed wet instead of dry.

2. The extra cost in silt clearance would amount to at least Rs. 5,000.

3. The putting off of date of closure from 15th April to 1st May would result in nothing, as the supply of water in the river must continue to govern the situation.

4. The supply of water in the Tungabhadra fails generally *before* the 15th April and the canal therefore practically closes itself before that date.

5. The Special Deputy Collector asks for a guarantee of the canal water for irrigation till at least 15th April. No such guarantee can be given unless the Government are prepared to enhance the capital cost of the canal by constructing a large reservoir to keep up the supply to the canal, on the supply in the river falling too low.

6. Below the Penner anicut, the canal was kept open this year up to 1st May on the requisition of the ryots, and this could always be done if there is sufficient water in the Penner to serve the irrigation.

7. The water is usually let into the canal on the 15th June and it has to travel all the way to Cuddapah, a distance of 190 miles (filling on its way numerous tanks, small and large), which it takes about a month to do. It is necessary to let the water into the canal slowly and the banks have to be watched all along, as, owing to the two previous months of drought, they would be anything but water-tight and would be liable to breaches. This date can hardly be altered, nor does it seem necessary to do so, as the Special Deputy Collector states the ryots set but little value on the canal water for the first half-year.

8. *Paragraph* 8 *of the Board's Proceedings.*—It would be extremely unwise to dispense with the six Irrigation Superintendents. They have plenty to do in maintaining the distributaries in proper order; in distributing water and in preparing schemes for extension of irrigation where possible. What is really wanted is a better class of men for these posts—better educated and better trained.

9. *Paragraph* 11 *of the Board's Proceedings.*—The Cheypod project is by far the most promising of the three proposed. The field work of this project is reported to be completed and the Executive Engineer is now working it out. Nothing has been done towards the preparation of estimates for the other two projects as the Executive Engineer reports there is nothing to show that they will pay a fair interest on the capital outlay.

From Lieutenant-Colonel D. McNEIL CAMPBELL, R.E., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 28th September 1895, No. 2078.

[Your No. III/4 K.C., dated 16th September 1895.]

I have the honour to observe that as my predecessor Mr. Norfor reported that the canal practically closes itself before the 15th April, I agree with him that there is nothing to be gained by curtailing the closure of the canal which, on the other hand, would add considerably to the cost of clearance.

(b) It is probable that the channel could be allowed to silt up considerably and yet give all the supply at present required; but any small accumulation of silt by checking the velocity increases the deposit greatly, and if silt is allowed to accumulate for one year, the cost of clearance the following year would be far more than what it would have been if cleared each year.

(c) The estimate will be submitted as soon as possible.

No. 194 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, III Circle, has been instructed to make every endeavour to keep the Kurnool-Cuddapah canal open until second crop has been harvested; but, as pointed out by him, the canal generally closes itself before the 15th April from want of water. It will therefore be only in exceptional years that any alteration in the existing period of closure will be of any advantage.

Madras, 23rd October 1895.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

Order—No. 922 I., dated 2nd November 1895.

Recorded.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, III Circle.
" Chief Engineer for Irrigation.
" Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O. No. 922 I., 2nd Nov. 1895.

NOVEMBER.

Kurnool-Cuddapah Canal

Correspondence regarding an alteration in the existing period of closure of the —, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 10th August 1895, No. 254.

From the Collector	of Anantapur,	dated	1st June	1895,	No.	1467.
,,	,,	of Arcot, North,	,,	26th July	,,	,,	996-Dis.-Eng.
,,	,,	of Arcot, South,	,,	4th June	,,	,,	1286-Ver.
,,	,,	of Bellary,	,,	28th May	,,	,,	277-R.P.R.
,,	,,	of Chingleput,	,,	17th June	,,	,,	302-Ref.-Pl.
,,	,,	of Coimbatore,	,,	28th ,,	,,	,,	1651-Dis.-Rev.
,,	,,	of ,,	,,	8th July	,,	,,	1790-Dis.-Rev.
,,	,,	of Cuddapah,	,,	16th June	,,	,,	277-Ref.-Eng.
,,	,,	of Ganjám,	,,	6th ,,	,,	,,	2024-R.C.-Ver.
,,	,,	of Gódávari,	,,	20th ,,	,,	,,	93-Ver.
,,	,,	of ,,	,,	21st ,,	,,	,,	1725-Ver.
,,	,,	of ,,	,,	30th ,,	,,	,,	1829-Ver.
,,	,,	of Kistna,	,,	2nd July	,,	,,	2602-Ver.
,,	,,	of Kurnool,	,,	15th June	,,	,,	1074-Dis.-Eng.
,,	,,	of Madras,	,,	10th ,,	,,	,,	1488.
,,	,,	of Madura,	,,	11th ,,	,,	,,	206-R.C.-Pl.
,,	,,	of Malabar,	,,	10th ,,	,,	,,	965-Pub.
,,	,,	of Nellore,	,,	19th ,,	,,	,,	1432-Ver.
,,	,,	of Salem,	,,	6th ,,	,,	,,	2403.
,,	,,	of Tanjore,	,,	24th ,,	,,	,,	1178-Ver.
,,	,,	of Tinnevelly,	,,	12th ,,	,,	,,	1068-Dis.-Gl.
,,	,,	of Trichinopoly,	,,	3rd ,,	,,	,,	1449-Dis.-Rev.
,,	,,	of ,,	,,	24th ,,	,,	,,	1588-Dis.-Rev.
,,	,,	of Vizagapatam,	,,	13th ,,	,,	,,	125.

Resolution—dated 10th August 1895, No. 254.

With reference to G.O. No. 271, dated 23rd January 1894, the Board resolves to submit to Government a statement for 1894–95, showing the condition of tanks in charge of the Revenue Department which affect the railway lines in each district.

2. The delay in the submission of this statement was due to the non-receipt of the necessary information from most of the Collectors till long after the prescribed date; the last return, namely, that from North Arcot, was received only on the 30th ultimo. The Collectors attribute the delay to the difficulty in obtaining complete information regarding such works. The variations, wherever they occur, between the total number of tanks as now reported and the number given in the statement for the previous year, are ascribed to the same cause.

3. It appears that lists of tanks affecting railways have been furnished by the Public Works Department only for the marginally-noted districts, and that even some of these lists are incomplete and require further alteration. The Collector of Tanjore also received a list from the Executive Engineer, but as it showed 167 tanks as against only nine shown by the Divisional officers, he has called for a

1. Gánjam.	6. North Arcot.
2. Vizagapatam.	7. South Arcot.
3. Gódávari.	8. Trichinopoly.
4. Cuddapah.	9. Madura.
5. Kurnool.	

revised list, and pending its receipt he has adopted the figures furnished by the Divisional officers. The Collectors of Bellary, Tinnevelly and Coimbatore do not state whether they have received lists from Public Works Department; the necessary information should now be furnished. The Collector of Salem reports that he has called for correct lists of tanks from the Tahsildars, and that he will have them revised, if necessary, in communication with the Superintending Engineer. In the remaining districts, except Madras, lists are awaited from the Executive or Superintending Engineers, some of whom have applied to the Chief Engineer for Irrigation for additional establishments for collecting the necessary information. It is requested that the lists and maps of tanks affecting the safety of railways in North Arcot and other districts referred to in paragraph 4 of the Chief Engineer's note embodied in G.O. No. 862 I., dated 8th November 1894, may be prepared and issued as early as possible. The Board also considers that the question alluded to in paragraph 2 of the same order, namely, whether the Public Works Department should prepare plans and estimates for the repair of zemindari and private tanks, should be decided at an early date.

4. According to the figures furnished by the Collectors, there are altogether 3,016 tanks affecting railway lines, of which 1,352 are Government, and 1,664 private works. Of these, 1,237 were reported to be in good order at the beginning of the year; 250 were repaired during the year, leaving 1,529 works which stand in need of repairs.

5. The Collector of Trichinopoly states that most of the tanks shown in his statement as being in good order, were reported by the Superintending Engineer to be in need of repairs; but that, on a reference to the Tahsildars concerned, he found that in the majority of cases the repairs proposed were practically of the nature of improvements, being extensions of bye-washes and the construction of calingulas, &c. The Collector promises to carry out these improvements in the current year. The 102 tanks stated to be situated in the Pudukkóttai State have been included in the figure entered in the statement against Trichinopoly, and should be included by the Collector in his future lists.

(True Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

APPENDIX.

Statement showing the condition of tanks affecting railways during 1894–95.

Districts.	Minor tanks under Revenue Department. In good order. Repaired up to the year.	Minor tanks under Revenue Department. In good order. Repaired in the year.	Minor tanks under Revenue Department. In need of repair.	Private, zemindari, &c., tanks. In good order. Repaired up to the year.	Private, zemindari, &c., tanks. In good order. Repaired in the year.	Private, zemindari, &c., tanks. In need of repair.	Total. In good order. Repaired up to the year.	Total. In good order. Repaired in the year.	Total. In need of repair.	Total. Total. Government.	Total. Total. Private.	Total. Total.	Remarks explaining fully the condition of tanks in need of repair and why they have not been taken up for repair.
1. Ganjám	11	3	19	70	..	98	81	3	117	33	168	201	Most of the tanks require only slight repairs; Executive Engineer requested to furnish list of such tanks as require urgent repairs in the current year.
2. Vizagapatam ..	2	3	..	51	11	72	53	14	72	5	134	139	List of tanks received from the Executive Engineer too late for the necessary action to be taken within the year; notices since issued to owners to carry out the necessary repairs as early as possible.
3. Gódávari ..	..	1	129	..	..	145	..	1	274	130	145	275	Six will be repaired this year and 123 next year. *Private tanks*—three, notice served on owner; officers concerned asked to take necessary action regarding the rest.
4. Kistna	12	21	12	64	7	130	76	28	142	45	201	246	Repairs of Government tanks almost completed by Tank Restoration Party. *Private tanks*—Divisional officers instructed to impress on owners the urgent necessity of keeping them safe.
5. Nellore	14	5	8	15	6	39	29	11	47	27	60	87	Two under repair; one, estimate under scrutiny; five, estimates being prepared. *Private tanks*—two will be repaired soon; four, notice served on owner; enquiry being made regarding the rest.
6. Cuddapah ..	40	1	118	45	..	168	85	1	286	159	213	372	*Government tanks.*—One will be repaired this year; one abandoned; five, estimates called for. Three private tanks, action will be taken under Act IV of 1886. The rest will be repaired as early as possible. Short work due to late receipt of lists of tanks from Executive Engineer.
7. Anantapur ..	31	1	18	15	..	3	46	1	21	50	18	68	One being repaired this year; two under repair by Public Works Department; ten under investigation by that department; four included in the list of famine-relief works; one, made over to Public Works Department. *Private tanks*—one, notice issued to owner; two, enquiry being made.
8. Bellary	8	..	..	3	..	..	11	..	..	8	3	11	......
9. Kurnool	35	2	14	2	..	1	37	2	15	51	3	54	Two under repair; steps will be taken for the early repair of the rest.
10. Madras	1	4	..	..	..	..	1	4	..	5	..	5	......
11. Chingleput ..	12	1	10	21	..	27	33	1	37	23	48	71	One under repair; seven, steps are being taken for repairs; two will be repaired next year. *Private tanks*—twenty-five, notices given to owners; two, steps will be taken for repairs.
12. North Arcot ..	113	6	103	96	7	69	209	13	172	222	172	394	Fifty-nine under repair; 44 will be repaired next year. *Private tanks*—notices served on owners to put the tanks in order.
13. South Arcot ..	134	2	13	8	..	1	142	2	14	149	9	158	Seven under repair; six more under repair by Public Works Department; one private tank, steps being taken for repairs.
14. Tanjore	8	1	..	..	..	..	8	1	..	9	..	9	......

Statement showing the condition of tanks affecting railways during 1894–95—*cont.*

Districts.	Minor tanks under Revenue Department.			Private zemindari, &c., tanks.			Total.						Remarks explaining fully the condition of tanks in need of repair and why they have not been taken up for repair.
	In good order.		In need of repair.	In good order.		In need of repair.	In good order.		In need of repair.	Total.		Total.	
	Repaired up to the year.	Repaired in the year.		Repaired up to the year.	Repaired in the year.		Repaired up to the year.	Repaired in the year.		Government.	Private.		
15. Trichinopoly ..	43	55	5	41	71	104	84	126	109	103	216	319	Two will be repaired this year; one, estimate sent to Executive Engineer for check; one, estimate being revised; one, abandonment under consideration. *Private tanks*—One, notice served on owner; one, situation not known, enquiry being made. The remaining tanks are in the Pudukkóttai State, and the Political Agent has been asked to take the necessary action.
16. Madura	108	19	88	22	..	69	130	19	157	215	91	306	Six under repair; four will be repaired this year; fourteen under Tank Restoration Scheme Party; one, estimate called for; one abandoned; thirty-two having been reported by Revenue Inspectors to be in good order, Executive Engineer has been asked to give his opinion; thirty recommended to be assigned on special rates. *Private tanks*—thirty, notices issued to owners, further steps are being taken for repairs; thirty-eight, Public Works Department will be addressed; one, situation not known.
17. Tinnevelly ..	48	8	5	41	14	23	89	22	28	61	78	139	One under repair; one will be repaired this year; one, estimate under preparation; two being investigated by Tank Restoration Party. *Private tanks*—three under repair; ten, estimates ready and notices will be issued to owners under section 5 of Act IV of 1886; four, estimates called for; two, notices served on owners; four abandoned.
18. Coimbatore ..	7	..	..	..	..	..	7	..	..	7	..	7	......
19. Salem	43	1	6	73	..	32	116	1	38	50	105	155	One will be repaired this year; five, estimates being prepared by Executive Engineer. *Private tanks*—seven, notices served on owners twice; twenty-five, estimates being prepared by Public Works Department.
Total ..	670	134	548	567	116	981	1,237	250	1,529	1,352	1,664	3,016	

Mis. No. 3602, Revenue.

Transferred to the Public Works Department.

OOTACAMUND,
5th September 1895.

(Signed) E. GIBSON,
Secretary to Government.

No. 190 I.

Note by the Chief Engineer for Irrigation.

With its Proceedings No. 254, dated 10th August 1895, the Board of Revenue submitted a statement showing the condition of the railway affecting tanks in charge of the Revenue Department including zemindari and private tanks in each district for 1894–95 as called for in paragraph 2 of G.O. Mis. No. 271, Revenue, dated 23rd January 1894. It is reported that 250 tanks were repaired during the year and 1,487 tanks to end of the year, leaving 1,529 tanks to be attend to.

2. The following statement compares by districts the numbers of tanks in the statement received from the Board of Revenue with those reported by Superintending Engineers :—

—	Board's statement.			Superintending Engineer's statement.					Not yet In-spected.
	Revenue Depart-ment.	Private and zemin-dari.	Total.	Revenue Depart-ment.	Private and zemin-dari.	Total.	In good order.	In-spected.	
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS	
Ganjám	33	168	201	33	169	202	51	151	..
Vizagapatam	5	134	139	5	135	140	50	77	13
Gódávari	130	145	275	151	337	488	215	261	12
Kistna	45	201	246	43	243	286	6	68	212
Nellore	27	60	87	10	29	39	11	..	28
Cuddapah	159	213	372	155	218	373	91	282	..
Anantapur	50	18	68	9	2	11	11	..	..
Kurnool	51	3	54	49	7	56	45	11	..
Bellary	8	3	11	7	4	11	11	..	..
Madras	5	..	5	5	..	5	5	..	..
Chingleput	23	48	71	22	49	71	15	3	53
North Arcot	222	172	394	242	159	401	145	..	256
South Arcot	149	9	158	149	9	158	133	14	11
Tanjore	9	..	9	167	6	173	..	6	167
Salem	50	105	155	..	131	131	77	23	31
Coimbatore	7	..	7	..	..	..	..	..	..
Trichinopoly	103	216	319	101	113	214	..	214	..
Madura	215	91	306	229	96	325	129	196	..
Tinnevelly	61	78	139	81	65	146	53	93	..
Total ..	1,352	1,664	3,016	1,458	1,772	3,230	1,048	1,399	783

The variations still existing between the numbers of tanks shown in the statement of the Board of Revenue and reported by Superintending Engineers require explanation.

3. The question of preparing plans and estimates for the repair of zemindari and private tanks has not yet been settled. In the present state of the law it would, it is believed, be a more waste of time and money.

4. The condition of the railway affecting tanks under the charge of this department is shown in the following statement.

Divisions.	In good order.	Repaired.	Estimates prepared.	Requiring attention.	Total.
Ganjám	1	..	5	8	14
Vizagapatam	..	1	..	..	1
Gódávari	4	..	3	1	8
Kistna	..	1	..	1	2
Nellore	..	9	..	11	20
Cuddapah	15	1	4	5	25
Kurnool	17	..	1	..	18
Bellary	21	1	..	..	22
Chingleput	121	9	54	57	241
North Arcot	64	20	8	5	97
South Arcot	24	..	8	..	32
Tanjore	2	1	..	3	6
Salem	13	7	..	..	20
Coimbatore	16	2	2	..	20
Trichinopoly	7	..	..	9	16
Madura	36	8	7	4	55
Tinnevelly	4	..	1	1	6
Total ..	345	60	93	105	603

The Superintending Engineer, I Circle, having reported that the number of tanks in Ganjám and Gódávari districts shown in the statement for the previous year was incorrect, no comparison with the list now submitted is necessary.

5. The lists and maps of tanks affecting railways in the North Arcot district are in the Press, those for the Madura district are under preparation, and the rest will be prepared in due course. The preparation of these lists and maps is interrupted owing to the press of work in the office. It is hoped that good progress will be made shortly.

Kurnool.	Madras.
Bellary.	Chingleput.
Anantapur.	South Arcot.
Salem.	Tanjore.
Coimbatore.	Tinnevelly.

6. Lists and maps of tanks affecting railways in the districts noted in the margin have not yet been received from Superintending Engineers.

Madras, (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
14th October 1895. Chief Engineer for Irrigation.

Order—No. 923 I., dated 2nd November 1895.

Superintending Engineers will, without delay, ascertain, in communication with the Collectors concerned, the causes of discrepancies still existing in the statements submitted by them and by Collectors, and see that the statements for the current year are corrected and that the requirements of tanks receive careful attention.

2. The question whether plans and estimates should be prepared for zemindari and private tanks which affect railways is under consideration by the Chief Engineer, Public Works Department. Superintending Engineers will, in the meantime, arrange for the preparation of plans and estimates for the repair of such tanks as may be indicated by Collectors, when the owners agree to execute the repairs according to the estimate, or to have the repairs carried out by the Public Works Department or Revenue Department at the owners' expense.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer, Public Works Department.
„ the Chief Engineer for Irrigation.
„ the Consulting Engineer for Railways.
„ all Superintending Engineers.
„ the Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O. No. 923 I., 2nd Nov. 1895.

NOVEMBER.

Tanks affecting Railways

Superintending Engineers directed to see that the statements of — for the current year are corrected and that the requirements of tanks receive careful attention, and to arrange for the preparation of plans and estimates for the repair of such private tanks as may be indicated by Collectors, when the owners agree to execute the repairs or bear their cost.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

Telegram from the Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 30th October 1895.

Your No. 27. Rupees 4,000 required for flood damage repairs under 43. Kistna Northern division.

ORDER—No. 926 I., dated 2nd November 1895.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.

From Agricultural Works. Reserve—	RS.	*To* Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D. Ordinary Works. Kistna Northern Division.	RS.
Repairs	4,000	Repairs	4,000
Establishment	920	Establishment	920
Tools and plant	60	Tools and plant	60
Total ...	4,980	Total ...	4,980

2. The following deferred telegram will be sent :—

To the Superintending Engineer, II Circle.

"Your telegram, 30th ultimo. Additional grant Rs. 4,000 sanctioned under 43. Accounts not kept—Repairs."

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O. No. 926 I., 2nd Nov. 1895.

NOVEMBER.

Funds

Certain transfers of — for works in Kistna Northern division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

To the Superintending Engineer, III Circle, dated 15th September 1895, No. III/42 C.D.

ENCLOSURE.

Report.

The enclosed estimate provides for the total amount spent and to be spent on the repairs of the Doricheruvu tank during the famine and subsequently.

The total amount of the estimate is Rs. 5,900, and out of this amount Rs. 3,155 was spent during the famine in constructing a new sluice in the breach, partly filling the breach and in partly excavating two escapes on the high ground at the right and left ends of the bund. After the famine work was stopped, a fresh estimate was prepared for Rs. 2,425, but not sanctioned, and work resumed and almost finished when orders were received from the Superintending Engineer (*vide* his letter No. 1354, dated 22nd August 1893) to stop work. At this time there was still about Rs. 355 worth of work to be done to complete the repairs to the tank. The work that was done after the closing of the famine work consisted of completing the closing of the breaches and the removal of the high ground for the escapes. When the work was stopped the breach work was practically finished, but there is still some high ground to remove in front of the escapes; the total cost of work still to be done, as already stated, being about Rs. 355.

The report which was prepared to accompany the estimate for Rs. 2,425 is herewith sent as it contains full particulars of the repairs to the tank.

(Signed) S. B. MURRAY,
Executive Engineer.

From the Superintending Engineer, III Circle, dated 19th October 1895, No. 2293.

ENCLOSURE.

REPORT for remaining work done to Doricheruvu tank.

	RS.
Amount of estimate	355

The repairs of Doricheruvu tank were nearly completed when orders were received to stop work and to send in an estimate for the work remaining to be done. The enclosed estimate is for completing the repairs as originally intended. Two bye-washes were formed, one at each end of the bund, by cutting away rocky and gravelly ground; these have to be finished by clearing away some more gravel and rock. Some more earthwork is also required for the rear slope of the bund at the breach and also for the top. The training bank is to carry the surplus away from the bund. The shaded portions in the plans show the work remaining to be done.

(Signed) S. B. MURRAY,
Executive Engineer.

14th July 1895.

No. 201 I.

Note by the Chief Engineer for Irrigation.

With his Endorsement No. 1825, dated 24th October 1892, the Collector o Cuddapah submitted, for sanction an estimate, amounting to Rs. 952, for the restoration of the Doricheruvu tank, which was stated to have breached owing to insufficiency of the escape. This estimate was forwarded to the Superintending Engineer, III Circle, and in Memo. No. 36 C.D., dated 28th October 1892, instructions were given to submit a complete estimate for the restoration of the tank.

2. On the 7th August 1893 the Superintending Engineer forwarded with his letter No. 1190, an estimate amounting to Rs. 2,610 for improving the tank. It was then noted that Rs. 3,812 had been already spent as outlay. As it was anticipated that the total expenditure would have amounted to Rs. 8,000, were the bund at the breach made safe, it was not considered worth while to spend any more money on the tank, seeing that the revenue expected was only Rs. 200. The Superintending Engineer was informed accordingly in Memo. No. 28 C.D., dated 18th August 1893.

3. On the 23rd January 1894 the Superintending Engineer resubmitted for sanction an estimate of Rs. 2,425 for improving the tank, to enable payments to be made for work done. It was stated that the repairs to the tank which were first undertaken for famine relief under the supervision of the Public Works Department were, on the closure of famine works, continued under Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 7311, dated 6th September 1892, and that having once begun it was necessary to complete the sluice repairs and closing of the breach before the setting in of the rains in June 1893 apparently to avoid loss.

4. The Superintending Engineer was thereupon requested in Memo. No. 8 C.D., dated 10th February 1894, to report whether any estimate was ever sanctioned to cover any part of the outlay incurred, and to submit a complete estimate for the tank with explanation regarding the great delay which occurred in reporting that such a large expenditure had been incurred apparently without any estimate or sanction.

5. With his letter No. 872, dated 10th July 1894, the Superintending Engineer forwarded a complete estimate for Rs. 5,900, and reiterated that the repairs were first taken up as a famine-relief work under the Public Works Department and continued after the famine closed under the Board's Proceedings already quoted and that changes in Executive Engineers tended to cause delay in reporting the objectionable expenditure.

6. As the whole work, except forming escapes provided for in this estimate was apparently completed, the Superintending Engineer was instructed in Memo. No. 34 C.D., dated 21st July 1894, to have the escapes completed at once and forward a "completion report" after the works have been finished. The "completion report" submitted with Endorsement No. 1207, dated 19th July 1895, of the Superintending Engineer shows that the total expenditure incurred on the tank amounts to Rs. 5,817, which, it is recommended, the Examiner of Public Works Accounts may be authorized to pass.

7. The Superintending Engineer should arrange for having the tank inspected during the north-east monsoon in case the bank at the breach settles.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

21st August 1895.

Order—No. 930 I., dated 5th November 1895.

The Examiner of Public Works Accounts is authorized to pass the expenditure of Rs. 5,817 incurred in repairing the Doricheruvu tank in the Cuddapah division.

2. This sanction is registered as No. 126 I. of 1895–96.

3. The attention of the Superintending Engineer, III Circle, is drawn to paragraph 7 of the foregoing note by the Chief Engineer for Irrigation.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, III Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

2. On the 1st August 1893 the Superintending Engineer forwarded with his letter No. 1190, an estimate amounting to Rs. 2,449 for improving the tank. It was then reported that Rs. 1,842 had been already spent as work. As it was anticipated that the total expenditure would have amounted to Rs. 8,000, were the bund at the breach made safe, it was not considered worth while to spend any more money on the tank, seeing that the revenue expected was only Rs. 200. The Superintending Engineer was informed accordingly in Memo. No. 25 C.I.C., dated 18th August 1893.

3. On the 22nd January 1894 the Superintending Engineer resubmitted for sanction an estimate of Rs. 2,449 for improving the tank, to enable payments to be made for work done. He reported that the repairs to the tank which were first undertaken as famine relief under the supervision of the Public Works Department were, on the closure of famine works, continued under Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), No. 2412, dated [illegible] 1892, and that having once begun it was necessary to complete the entire repairs and closing of the breach before the setting in of the rains in June 1893 apparently to avoid loss.

4. The Superintending Engineer was thereupon requested in Memo. No. 8 I.C.B., dated 10th February 1894, to report whether any portion of the work was ever sanctioned to cover any part of the outlay incurred, and to submit a complete estimate for the tank with explanations regarding the circumstances which operated in requiring that such a large expenditure had been incurred apparently without any estimate or sanction.

5. With his letter No. 8,738, dated 16th July 1894, the Superintending Engineer forwarded a complete estimate for Rs. 6,500 and remarked that the repairs were first taken up as a famine relief work under the Public Works Department and continued after the famine ceased under the Board's Proceedings already quoted and that changes in Executive Engineers tended to cause delay in reporting the unsanctioned expenditure.

6. As the works had, except pitching, perhaps provided for in this estimate been apparently completed, the Superintending Engineer was instructed in Memo. No. 81 C.B., dated 21st July 1894, to have the records completed at once and forward a "completion report" after the works had been finished. The "completion report" submitted with Endorsement No. 1,979, dated 17th July 1895, of the Superintending Engineer shows that the total expenditure incurred on the tank amounts to Rs. 6,817, which, it is recommended, the Examiner of Public Works Accounts may be instructed to pass.

7. The Superintending Engineer should arrange for having the tank inspected during the north-east monsoon to see the bank at the breach settles.

(Signed) R. E. B. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

21st August 1895.

Order—No. 920 I., dated 5th November 1895.

The Examiner of Public Works Accounts is authorized to pass the expenditure of Rs. 6,817 incurred in repairing the [illegible] tank in the [illegible] district.

2. This sanction is registered as No. 131 I. of 1895-96.

3. The attention of the Superintending Engineer, III Circle, is drawn to paragraph 7 of the foregoing note of the Chief Engineer for Irrigation.

(True Extract.)

(Signed) R. E. B. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
Superintending Engineer, III Circle.
Examiner, Public Works Accounts.
Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras

PUBLIC WORKS.

Dated November, 5th.

Recd. *Encl.*

G.O. No. 930 I., 5th Nov. 1895.

NOVEMBER.

Doricheruvu Tank

The Examiner, Public Works Accounts, authorized to pass the expenditure of rupees 5,817 incurred in repairing the — in the Cuddapah division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

From M.R.Ry. C. SITARAMAYYA Pantulu Garu, Chairman, Municipal Council, Ellore, to the Chief Secretary to Government (through the Divisional Officer and Collector, Gódávari), dated 13th September 1895, No. 41-Eng.

I have the honour to report that on the 6th instant the town of Ellore was flooded by the two branches of the Tammileru, and many houses in the north, west and south of the town were seriously damaged, and even the new suburb Powerpetta also shared the same fate.

2. The flood water entered the town through Powerpetta at about 3 in the morning of the 6th instant from the Western branch of the Tammileru river near the aqueduct, an hour later the Eastern branch flowed over its banks near Chintalapudi road, and at about 11 o'clock in the forenoon the Kistna canal, which received the flood water, overflowed its banks near the Sanivarappetta ferry-crossing and flooded the southern portion of the old town.

3. To drain the town of flood water which has risen to a height of about 6 feet at 8 A.M., a breach was cut in the Kistna canal south bank and in the north bank of the Eastern branch of the Tammileru river.

4. At about 10 A.M., as the state of things showed that the water was rapidly decreasing and that the breaches have controlled the flood, seven breaches were made in the north bank of the Kistna canal to relieve the town of water. Before it was dark, almost the whole town was relieved from water except low-lying plains; these were drained the following day by deepening the breaches on the north bank of the canal.

5. The flood, I believe, was caused by several hill-streams overflowing their banks and by numerous tanks bursting their bunds on account of the very heavy rains we had the whole of the previous day and night, and that Ellore was not the only place that suffered, but several villages lying within a radius of 15 miles or more from Ellore, and it has been also reported that several persons and cattle were drowned. The railway line has also been washed away for about 30 miles, and telegraphic and postal communications were also stopped for three and four days, respectively.

6. At Ellore there were about 2,000 people without homes for two days, but now they are gradually repairing their huts and housing themselves. On the 6th and 7th certain charitable gentlemen provided food to almost all the poor classes of people or whoever went to them for food.

7. The amount of damages to house property is estimated at Rs. 23,693, and, I solicit, Government will be pleased to sanction at least a respectable amount of money, if not the whole, in order to enable the people of Ellore to repair, to a certain extent, the damages caused by the recent floods. It may not be out of place to mention here that in September 1882, when there was only some damage done by this very river Tammileru, Government was pleased to grant a sum of about Rs. 5,000 for relief of the distressed.

8. The municipality, I regret to state, cannot, with its little income, spare more than Rs. 500 towards compensating their servants for the loss sustained by them in addition to the extra expenditure they will soon have to incur in repairing the damages caused to roads and buildings and for breaching and closing the canal and river bunds, which will cost the municipality not less than a sum of Rs. 1,000.

9. If there was sufficient water-passage to relieve the town from flood water, the damages would not have been so great, nor so severe. There would certainly have been loss of life also, if unfortunately the flood had come at the dead of night. I am, therefore, from experience and information, of opinion that there should be an outlet over the mean water-level of the Kistna canal near the Jallipudi under-tunnel, and another on the north bank of the Tammileru Eastern branch near the trunk road crossing towards the Gódávari canal, one under-tunnel on each side of the present Jallipudi under-tunnel and two culverts under the Kistna canal bank on Powerpetta side of the town ; with these arrangements, I may say that in an unprofessional point of view, Ellore will be safe from being flooded. The railway authorities should also be asked to have five large openings made within municipal limits, at places to be pointed out under the railway line, where the embankments are high ; and these openings should be from the ground-level to below the rails, as the embankment had much to do in keeping the water from flowing freely towards the breaches made for the flow of the flood water.

10. In conclusion I feel it my duty to state that the Divisional officer and the Tahsildar under his orders, certain councillors and the municipal manager have rendered all possible assistance in connection with recent floods. I may also mention here that, but for the timely and prompt steps taken on 6th and 7th instant, the town would have suffered even greater and more serious damages. It appears such a heavy flood had never, for the last 45 years, visited Ellore, nor caused so much damage.

From L. G. MOORE, Esq., Acting Head Assistant Collector, Gódávari, to the Collector of Gódávari, dated Ellore, 14th September 1895.

I have the honour to forward a report received to-day from the Municipal Chairman, and to report regarding the recent floods in Ellore.

2. On the 5th instant there was heavy rain in Ellore all day, and on the morning of the 6th, the Tammileru overflowed its banks in two places, with the result that the greater part of Powerpetta and D Division of the municipality, which adjoins Powerpetta, was flooded as well as small part of A division. By 8 A.M., on the 6th instant there were nearly 3 feet of water in Powerpetta ; the hospital was flooded, and the main road was under water. By my directions the Tahsildar had the canal bank breached in several places with a view to carrying off the flood water. It must be remembered that Powerpetta is practically without any natural means of drainage, that it lies very low and is in fact nothing but the bed of an old tank. The railway line runs between Powerpetta (D Division) and the canal, and the difficulty of getting rid of the water was therefore increased. There is only one sluice at this point under the railway, and the water consequently ran off very slowly. However, within 18 hours of the commencement of the flood, all the water had been drained off. Everything that was possible was, I think, done in the matter, and I do not think, considering the natural difficulties, the water could have been more quickly carried off.

3. The Chairman of the Ellore Municipality has had a careful house-to-house list prepared, showing the houses which have suffered in A, D and E Divisions of the municipality in consequence of the flood. I have also personally seen all the houses affected. There can be no question that the flood had caused very considerable destruction of property. At the same time it may be mentioned that the houses are, for the most part, reed huts with thatched roofs, and are inhabited chiefly by poor Muhammadans and other persons. The huts are all huddled together, are built with mud walls, and are so weakly constructed that they cannot offer any resistance to a flow of water. I have requested by telegram that a sum of Rs. 5,000 should be

sanctioned for disbursement to those persons that have suffered by the flood. A sum of Rs. 4,500 was, at the request of Mr. Power, sanctioned under somewhat similar circumstances in 1882. It is, of course, essential that relief should only be given to those persons who are really poor, and that it should take the form of a grant of money to enable them to rebuild their houses. Every care will be taken to see that the amount is properly distributed. I have not noticed that any houses which were at all substantially or strongly built were much damaged by the flood, although many houses belonging to well-to-do persons in Powerpetta have suffered slightly.

4. I may state that, as far as I have been able to ascertain from enquiries which I have made, no lives were lost in Ellore. On the two days succeeding the flood, food was distributed by local merchants and others to persons who were destitute. I do not think that there is much distress at present. The flood was an unusually heavy one, and I understand that for 48 years no such flood has been experienced in Ellore.

From the list drawn up in Municipal office it appears that the damage caused in A Division of the municipality only amounts to about Rs. 600, and is quite insignificant. I do not think that any relief for the slight damage done in this part of the town is necessary. In fact no serious damage at all was caused to the greater part of Ellore, which lies to the other side of the Kistna canal, nor was the railway running through Ellore damaged in any place. The damage done in Powerpetta and D Division, which, for practical purposes, is the same as Powerpetta, is said to amount to Rs. 23,000 according to the lists which have been most carefully prepared. I am inclined to think the real damage is not as great as this, as people are naturally apt to exaggerate the extent of their houses in the hope of getting assistance. The Chairman agrees with me in thinking that, if Rs. 5,000 is distributed promptly and judiciously, much relief will be given to many genuine cases of distress.

5. I entirely agree with the remarks made by the Chairman in paragraph 9 of his letter as to the necessity of prompt steps being taken to render Ellore secure from the danger of floods of this kind. There can be no question that Powerpetta is very badly drained, and fresh openings might be made by the railway authorities to carry off water into the canal. I think that it would be advisable that the Executive Engineer of the division should be consulted in the matter, and asked to suggest what it would be advisable to do in this respect.

6. I regret to state that, although there was no loss of life in Ellore itself, some persons were drowned in some villages near Ellore owing to the bunds of tanks being breached by the flood. No accurate information is, however, at present available. Enquiries are being made, and a report will be sent as soon as the amount of the damage and the number of lives lost have been ascertained with some degree of accuracy. The floods have also seriously damaged the railway from about 2 miles south of Ellore.

7. In conclusion I may mention that the Chairman of Ellore took prompt measures to relieve, as far as he could, the distress caused by the flood, and that the Municipal Executive worked well. I regret the delay in submitting this report which is due to the fact that it took some time to collect accurate information regarding the exact extent of the damage done to property.

Ref. on C No. 3155 Ver.

Submitted to Government, Revenue Department, through the Board of Revenue (Land Revenue).

2. These reports clearly show that the main cause of the damage done to the town was first the railway embankment and then the banks of the canal, for practically no damage was done on the further side of the canal, where the main portion of the town stands, as the water had ample room to spread itself out over the fields. As suggested by the Head Assistant Collector, in paragraph 5 of his letter, the Executive Engineer, Western Division, will be requested to report what measures are necessary

to secure Powerpetta and the portion of the town to the north of the canal, generally from a recurrence of such a disaster hereafter, and paragraph 9 of the Chairman's letter communicated to him.

3. I have already telegraphed to Government at the instance of the Divisional officer for a grant of Rs. 5,000 to the poor to enable them to rebuild their dwellings, and I would again urge the expediency of such a grant, first, because these reports clearly show that the canal and railway (both Government undertakings), caused the damage, and also because the principal sufferers are the very poor, the walls of whose houses being made of black cotton-soil mud cannot stand soaking. It will probably suffice to give Rs. 10 each to the poor who have lost their dwellings to enable them to purchase materials for roofing them. The walls and basements they can construct themselves. If any aid, however, is to be given, the sooner it is given the more welcome will it be.

4. I regret to have to say that some lives are reported to have been lost in the out-lying parts of the taluk through the bursting of tanks. The further report promised on this point by the Divisional officer will be forwarded on receipt, but I do not anticipate that the loss has been very serious; for the main villages are well out of harm's way in the event of such accidents, and the sufferers must have been either labourers working in the fields or, what is more probable, farm labourers residing, not in the village, but in the fields of their employers. Outside the delta these are not numerous.

5. The Amalapur Tahsildar—and the rain was far heavier at Amalapur (20 inches) than at Ellore—reports that two persons are missing and supposed to have been drowned, but no other taluks save Amalapur and Ellore, I am glad to say, report any loss of life, though the rain was very heavy and the gale destructive to trees throughout the delta. I do not also anticipate much permanent damage to the crops. Special reports from taluk through Divisional officers were called for by me some days ago, but none have yet been received. On receipt a general report on the effects of the storm will be submitted. No wrecks on the coast have been reported, but it is said some vessels have foundered at sea. Nothing, however, is yet known for certain regarding this. Any information I may receive will be promptly communicated.

Cocanada, (Signed) V. A. BRODIE,
17th September 1895. Acting Collector.

Proceedings of the Board of Revenue (Land Revenue), Mis. No. 4810, dated 25th September 1895.

Resolution—Mis. No. 4810, dated 25th September 1895.

Forwarded.

2. The Honourable Mr. Sturrock's report on the state of the country between Bhimadole and Bezwada is being forwarded.

(True Extract.)

(Signed) L. M. WYNCH,
Secretary.

Mis. No. 3941, Revenue.

Transferred to the Public Works Department, Irrigation Branch.

Ootacamund, (Signed) W. B. AYLING,
1st October 1895. Ag. Assistant Secretary.

Read—Endorsement of the Collector of Gódávari, dated 17th September 1895, Ref. on C. No. 3155 Ver., on letter from the Head Assistant Collector, Gódávari, dated 14th September 1895.

ORDER—No. 933 I., dated 5th November 1895.

Communicated to the Consulting Engineer for Railways with reference to the Collector's remarks as to the inadequacy of the water-way through the East Coast Railway embankment at Ellore.

2. The Superintending Engineer, II Circle, will expedite the submission of the special report referred to in G.O. No. 855 I., dated 23rd October 1895. He will also report what is needed to make Ellore safe from floods, and how far the East Coast Railway is responsible for the damage done to the town all along its line.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Consulting Engineer for Railways.
„ Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 5th.

Recd. *Encl.*

G.O. No. 933 I., 5th Nov. 1895.

NOVEMBER.

Floods

Orders on endorsement in the Revenue Department transferring Proceedings of the Board of Revenue forwarding report submitted by the Collector regarding the damage caused by the recent — to the Ellore town and other places in Gódávari district.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

Application for modification of existing grants under Irrigation for the year 1895–96, V Circle.

Item number.	Division.	Works.	Amount of estimate.	Existing grant.	Modification applied for. Decrease.	Modification applied for. Increase.	Modification proposed. Decrease.	Modification proposed. Increase.	Revised grant.	Remarks.
		43. Minor Works and Navigation.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
		Works for which Capital and Revenue Accounts are kept.								
		Capital.								
		Lower Coleroon Anicut System.								
		Improving the drainage of the southern portion of the Chidambaram taluk.								
		Old Coleroon drain.								
1	South Arcot.	Compensation for land ..	17,160	17,160	..	6,500	..	6,500	23,660	The Collector states that all the lands required will be made over within this year, and the probable value of the lands to be acquired will be about rupees 24,000; hence the additional grant applied for.
		Irrigation Works for which Capital and Revenue Accounts are not kept.								
2	South Arcot.	Minor Original works ..	L.S.G.	11,440	1,000	..	1,000	..	10,440	Owing to cultivation season materials in some cases cannot be carted to sites of works; hence the surrender.
3	Do.	Tank Restoration works ..	Do.	32,000	4,000	..	4,000	..	28,000	
4	Do.	Agricultural works, Repairs.	Do.	3,950	183	..	183	..	3,767	The amount surrendered is not required for expenditure.

No. 345 E.I.

Submitted to the Chief Engineer for Irrigation with request that he will be so good as to obtain the sanction of Government to the modifications herein applied for.

Chepâk,
2nd November 1895.

(Signed) C. C. RAWSON, Lieut.-Col., R.E.,
Superintending Engineer, V Circle.

Order.—No. 934 I., dated 6th November 1895.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
South Arcot Division.

From

Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.

Ordinary Works.

	RS.	RS.	RS.
Minor Original works ...		1,000	
Establishment		230	
Tools and plant		15	
			1,245
Tank Restoration Works.			
Repairs		4,000	
Establishment		920	
Tools and plant		60	
			4,980
Agricultural Works.			
Repairs	183		
Reserve—Repairs.	38		
		221	
Establishment		51	
Tools and plant		3	
			275
Total ...			6,500

To

Minor Works for which Capital and Revenue Accounts are kept.

Capital Account.

Lower Coleroon Anicut System.

	RS.
Compensation for land	6,500
Total ...	6,500

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 6th.

Recd. *Encl.*

G.O. No. 934 I., 6th Nov. 1895.

NOVEMBER.

Funds

Certain transfers of — in the South Arcot division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 26th October 1895, No. 125 C.E.

I have the honour to enclose a copy of the tools and plant return for this division for the half-year ending August 1895, and to request orders as to the disposal of the articles therein enumerated.

2. Those entered in black type have already been disposed of either by sale or by transfer to other divisions under G.Os. Nos. 2569 W. and 3130 W., dated 15th October and 7th December 1894, respectively.

3. Of the remainder, I require instructions as to which articles you would wish to keep as being likely to be useful hereafter in the Public Works Stores or in other divisions and which to sell and in view of the very heavy expense of transport to the Public Works Stores at Madras, amounting to about Rs. 70 per ton, I would recommend that as much as possible of it shall be sold.

4. With regard to prices I would suggest that I may be authorized to fix these. The value arrived at by an arbitrary annual deduction from the original book value is likely to be widely wrong in many cases and I would propose to fix their values by consideration of each item on its own actual merits. I would then advertise a price list, and of all such things that are not sold by the 15th January 1896 at the price list values I would hold an auction at Periyár on that date.

5. Your selection of the items to be reserved for Government will of course be made on the assumption that such items are in fairly good order. Should it appear from my final inspection of them at the close of the works that any of them are so much worn as to make it doubtful whether they are worth reserving, I will again report on these accordingly, and will suggest that such should be relegated to the proposed auction in January 1896.

6. The favour of early orders is requested.

Enclosure.

No. I Periyár Division.

List of machinery and tools, &c., available for sale or transfer to other divisions on the 31st August 1895.

Item number.	Particulars.	Number.	Remarks.
	Scientific Instruments.		
1	Levels, cushings	5	Lent to Madura Division officer. a.
2	Staves, telescopic	10	
3	Theodolite	2	
4	Omnimeter	1	
5	Prismatic compass	4	
6	Chain, measuring 100 feet	3	
7	Do. 50 ,,	4	
8	Tape, metallic 100 feet	14	
9	Do. 50 ,,	15	

List of machinery and tools, &c., available for sale or transfer to other divisions, &c.—*cont.*

Item number.	Particulars.	Number.	Remarks.
	Scientific Instruments—cont.		
10	Steel tape, 50 feet	3	
11	Mathematical instrument box, 1st class	2	
12	Do. do. 2nd ,,	1	
13	Do. do. 3rd ,,	3	
14	Straight edge brass	3	
15	Rules, parallel rolling	8	
16	Scales, plotting .. sets	5	
17	Pentagraph	1	
18	Spirit levels	9	
19	Plumb bob	6	
20	Steel foot rule	3	
21	Scales, card boards	2	
22	Thirty inches T square	1	
23	French curves	18	a.
24	Drawing pens, 1st class	2	
25	Rain gauges, tin	2	
26	Rain gauge, Crossley's	1	
27	Current metre	1	
28	Rule folding box, wood, 3 feet	3	
29	Do. do. 2 ,,	3	
30	Quadrant ghât tracing	1	
31	Cross staff	1	
32	Tachometer	1	
33	Jees pit levelling staves	2	
34	Barometer	1	
35	Slope rule	1	
36	Photographic comera, Stanley's	1	
	Tunnel Machinery.		
37	Rock boring machine	8	
38	Air compressor	2	
39	Air distributor	2	
40	Air receivers	2	
41	Water injector	1	
42	Blast fan with shaft to exhaust 6 000 cubic feet	1	
43	Rock drilling machine, hand, Jordons (patent)	2	b.
44	Rock drills of sizes	144	
45	Roots boiler, 15 horse power	3	
46	Horizontal engine and compressor, 15 horse power	2	
47	Receivers	2	
48	Three and a half inches rock drilling machine	6	
49	Six feet stretcher bar with clamps, &c.	8	
50	Distributors	2	
51	Four inches rock drilling machine	6	
52	Compound rock drills	6	
53	Horizontal engine and compressor, 50 horse power	1	a.
	Concrete manufacturing machinery.		
54	Stone breakers	1	
54A.	Stone breakers	8	
55	Mortar mixers	2	
56	Concrete mixers	2	
57	Disintegrators	4	
58	Conveyors	4	b.
59	Mortar mill, complete	3	
60	Main shaft with pulleys	1	
61	Counter shaft with pulleys	2	
62	Shaft with measuring drums	1	
	Light Railway plant.		
63	Portable Railway .. feet	3,000	Sold—*vide* G.O. No. 317 W., dated 7th February 1895.
63A.	Portable railway .. feet	8,088	
64	Points and crossings .. sets	25	
65	Turn tables	5	
66	Side tipping wagons	54	a.
67	End tipping wagons	25	
	Turbines.		
68	150 horse power turbine with shaft and gearing	1	a.
69	Turbine, 60 horse power	1	
70	Turbine, 50 horse power	1	
71	Turbine, 6 horse power	1	Sold—*vide* G.O. No. 2569 W., dated 15th October 1894.
	Hoisting gear.		
72	Crane, portable, 1 ton	6	a.
73	Do. do. ½ ton	6	
74	Crab winch, 5 tons	2	b.
75	Do. 4 tons	1	
76	Do. 3 tons	3	
77	Do. 2 tons	2	
78	Hydraulic jacks	2	
79	Travelling jacks	2	a.
80	Blocks, iron, galvanized	26	
81	Do. Westons differential, 2 tons	1	
82	2-ton differential pulley block with chain	1	

List of machinery and tools, &c., available for sale or transfer to other divisions, &c.—*cont.*

Item number.	Particulars.	Number.	Remarks.
	Hoisting gear—cont.		
83	Lifting gear for locks .. .. pairs	2	b.
84	Winding engine with fittings complete	1	a.
85	Derrick crane	1	} b.
85A.	Derrick crane	1	
	Pumps.		
86	Horizontal double acting force pumps to throw 3,000 gallons per hour to a height of 150 feet.	1	
87	Tangeys special steam pump 8″ steam cylinder and 5″ water cylinder with condenser foot valve, steam and water pipes for a lift of 140 feet.	1	
88	Tangeys special steam pump 4″ steam cylinder and 4″ water cylinder with condenser foot valve, steam and water pipes for a lift of 60 feet.	1	a.
89	Tangeys special steam pump with 8″ steam cylinder and 4″ water cylinder.	1	
90	Pump, centrifugal, 10″	1	
91	Pump, centrifugal, 8″	1	
92	Pump, centrifugal, 6″	1	Transferred—*vide* G.O. No. 187 I., dated 26th February 1895.
93	Pump, Pulsometer No. 5	4	} a.
94	Do. do. No. 4	1	
95	Hand pumps	7	b.
96	Archimedian screws	4	Two transferred—*vide* G.O. No. 187 I., dated 26th February 1895.
97	Sand pumps with cutter and gearing	1	b.
98	Flexible steam hose	3	
99	Ten feet length of wire-bound delivery hose	2	a.
100	Centrifugal pump 1½″	1	
101	Pitcher spout pump with steel driving point and wrought iron pipes.	1	b.
102	Flexible suction hose	5	a.
103	Donkey pump	3	b.
104	Tanned canvas rubber lined delivery hose	1	} a.
105	Do. do. 195′	1	
106	Guy screws	6	b.
	Engine and steam boilers.		
107	Portable engine, 8 horse power	3	
108	Do. do. 6 do.	2	
109	Vertical boiler, 6 do.	3	
110	Portable Locomotive boiler	1	a.
110A.	Portable Locomotive boiler	1	
111	Pressure gauge	4	
112	Portable engine, 10 horse power	2	
113	Oil engines	2	a (One of them lent will be kept with the launch to which it belongs.)
	Lights.		
114	Wells light, large	4	
115	Do. small	3	a.
116	Wells Hurricane lamps	3	
117	Public Works square lanterns	15	
118	Wells torch lamps	15	b.
119	Coxe Plummet lamps	2	
120	Engine head lamp	1	
	Weighing plant.		
121	Weighing machine, 4 tons	2	
122	Do. 1 ton	2	b.
123	Beam scale	2	
124	Fair banks weighing machine	1	a.
	Electric plant.		
125	Electric firing machine	1	
125A.	Electric firing machine	1	a.
126	Test box galvanometer	1	
127	Electric bell, 4½″	2	
128	Chattering bell	5	
129	Electric bell 2½″	1	
130	Bell inturruptor for continuous ringing	1	
131	Three shutter indicator with bell	1	
132	Leclanche battery, 4 cells	2	
133	Do. 2 ,, ...	2	a.
134	Bell wire .. .. yards	690	
135	Insulators	40	
136	Wire single galvanized miles	3½	
137	Chinapushes cream colors	1	
138	Level belt stretcher	1	
139	Belt shippers	1	
	Wire Ropeway.		
140	A. Ropeway, 6 miles	1	
141	B. Ropeway, half mile	1	b.
142	Buckets with hangers	25	

List of machinery and tools, &c., available for sale or transfer to other divisions, &c.—*cont.*

Item number.	Particulars.	Number.	Remarks.
	Miscellaneous.		
143	Circular saw table with fly wheel, complete	1	b.
144	Semiportable steam saw mill	1	
145	General joiner	1	a.
146	Hydraulic press, 50 tons	1	
147	Tipping boxes	100	
148	Bulls dredger	13	
149	Trolly, four wheeled	1	b.
150	Surki screens	19	
151	Sand do.	25	
152	Priestman's steam dredger	1	
153	Luthe screw cutting	1	
154	Grinding stone with trough and pully to work by steam power	1	a.
155	Fan blowers or ventilating	1	
156	Jim crows	3	
157	Winchester rifle	1	b.
	Floating plant.		
158	Rowing boat	3	All these should be sold by auction on the spot except the "Daisy," "Mary" and "Maud" and the ten iron barges, which should be retained for future use on the lake.
159	Half out rigged boat	1	
160	Wooden barge, large and small	20	
161	Wrought iron barge	4	
162	Steam launch	3	
163	Cochin boat, large and small	26	
164	Dug-out	7	
165	Iron framed punt	2	
	Tools, Ordinary.		
166	Pick-axes	660	
167	Hand axes	61	
168	Felling axes	522	
169	Hammers, sledge	625	
170	Do. hand	57	
171	Do. steel stone breaking, 3, 4, 5, 7 and 10 lb	2044	
172	Do. miners	74	
173	Mamoties	2283	
174	Crow bars	406	
175	Jumpers	1598	
176	Bill hooks, country	373	a.
177	Rammers, iron	39	
178	Road tampers	199	
179	Shovels and spades	69	
180	Sickles	143	
181	Steel wedges	135	
182	Pitch forks	3	
183	Rakes	5	
184	Screw jumpers	3	
185	Pointing trowels	95	
186	Steel amalgum bell with cast iron bracket	1	
187	Earth angers	1	
188	Masons trowels	1	
189	Tin opener	2	
190	Tin cutter	2	
191	Glass cutter	1	
192	Iron chatties	800	
193	Galvanized iron buckets	368	b.
194	Watering cans	109	
195	Empty tins	678	
196	Nipper	3	
197	Picottah buckets	4	
198	Brass padlock	1	
	Workshop Tools.		
199	Bellows, english	19	
200	Anvils	24	
201	Swage blocks	2	
202	Revetting hammers	8	
203	Do. dies top and bottom	12	
204	Steel hammers, 1½ lb	14	
205	Do. 1 lb	8	
206	Files of sizes	496	
207	Vices, large	15	
208	Do. hand	4	
209	Chisels, cold	56	
210	Ratchet braces with bits	11	a.
211	Taps and dies and stock	sets 12	
212	Screw plate with 4 taps	1	
213	Monkey wrench	12	
214	Clyburn spanner	22	
215	Ordinary spanner	17	
216	Gas tongs	8	
217	Tongs	15	
218	Snaps punch	2	
219	Burnishers	3	
220	Carpenters' tool box	3	
221	Do. compass	2	

List of machinery and tools, &c., available for sale or transfer to other divisions, &c.—*cont.*

Item number.	Particulars.	Number.	Remarks.
	Workshop Tools—cont		
222	Anger of sizes ..	187	
223	Saw, hand	69	
224	Do. large	12	
225	Do. circular	3	
226	Do. bow	1	
227	Nail puller	2	
228	Grinding stone ..	3	
229	Callippers	7	
230	Hydraulic punching gear	1	
231	Tube erepander	2	
232	Blacksmiths' and fitters' tools in box	set 1	
233	Planes trying	2	
234	Do. joining ..	2	
235	Bellows, country	4	a.
236	Fitters compass	1	
237	Blacksmiths' hammer	2	
238	Wrench parrot nose to take 1" to 2" pipe ..	1	
239	Tongs adjustable pipe No. 3 ($\frac{3}{4}$" to $2\frac{1}{4}$")	1	
240	Pipe wrench and tube cutters No. 2 (1" to 2")	1	
241	Instantaneous vice	6	
242	Portable forge ..	2	
243	Portable vice on wheels ..	2	
244	Oil stone turkey in case ..	1	
245	Crucibles	2	
246	Marble mortor ..	1	
247	Pincers	2	
248	Saws tenon	2	
249	Soldering tools ..	2	

Periyar,
26th October 1895.

(Signed) S. D. PEARS,
Supdt. of Works, No. I Periyár Divn.

Order—No. 935 I., dated 7th November 1895.

The items in the statement appended to the foregoing letter which are marked "*a*" will be transferred to the Public Works Stores and those marked "*b*" will be sold at Periyár. It will be understood that the selection is in accordance with paragraph 5 of the Superintendent of Works' letter.

2. The Superintendent of Works will have full discretion as to the prices to be charged to the Public Works Stores; these prices should be what the articles may reasonably be supposed to be worth *at the stores*, the cost of carriage thereto being borne by the project.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ the Consulting Engineer for Railways.
„ Superintending Engineers.
„ the Consulting Architect to Government.
„ the Superintendent of Works, No. I Periyár Division.
„ the Examiner, Public Works Accounts.
„ the Chairman, Harbour Trust Board.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O. No. 935 I., 7th Nov. 1895.

NOVEMBER.

Tools and Plant

Orders as to the disposal of the — in No. I Periyár division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

From W. HUGHES, Esq., Superintending Engineer, VI Circle, to the Chief Engineer for Irrigation, dated Trichinopoly, 24th September 1895, No. 547 M.D.

The classification of irrigation works in certain minor basins in the Madura district where the tank restoration work had been completed, was revised by the Executive Engineer in 1890 and the lists of works which it was proposed should be maintained by this department were submitted to you with this office Nos. 54 M.D., dated 18th April 1890, and 761 M.D., dated 6th November 1890, and the additions to the original list of Imperial works were sanctioned in G.O. No. 52 I., dated 16th January 1891.

2. It appears to have escaped notice both in this office and yours that certain tanks on the old list of Imperial works were omitted in the new lists having been transferred by the Executive Engineer to the Minor works lists. I request sanction to these proposed transfers of which I enclose a list extracted from the Minor works lists.

ENCLOSURE.

LIST of irrigation works in the Andipatti and Suruliyaur minor basins in Periyakulam Taluk proposed to be classed as minor and handed over to ryots (VI Circle—Madura Division).

Group.	Sub-group.	Number in group or isolated work, *i.e.*, T.R.S. No.	Number in existing Imperial list.	Name and description of irrigation work.	Existing irrigation.	Existing revenue.	Proposed irrigation.	Proposed revenue.	Remarks.
1	2	3	4	5	6	7	8	9	10
				Andipatti Minor Basin.	ACS.	RS. A. P.	ACS.	RS. A. P.	
Mavuthu odai group.	Sakkilichikulam.	8	121	Sakkilichikulam.	204·39	380 2 0	..	..	The maintenance of this tank does not require professional supervision. There are, besides, no other Imperial works near it.
				Suruliyaur Minor Basin.					
Surulinadi group.	Vyravan anicut channel.	29	49	Mathalamamadikulam tank.	290·42	1,122 7 0	290·42	1,122 7 0	Does not require professional supervision.

No. 197 I.

Submitted to Government with a recommendation that the Mathalamamadikulam and Sakkilichikulam tanks No. 49 and 121 in the list of Minor works, Public Works Department, Madura district, communicated with G.O. No. 407 I., dated 6th July 1887, be retransferred to the Revenue Department.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

26th October 1895.

ORDER—No. 936 I., dated 7th November 1895.

The proposal of the Chief Engineer for Irrigation is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, VI Circle.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O. No. 936 I., 7th Nov. 1895.

NOVEMBER.

Tanks

The proposal of the Chief Engineer for Irrigation that the Mathalamamadikulam and Sakkilichikulam —, Nos. 49 and 121 in the list of Minor works, Public Works Department, Madura district, be retransferred to the Revenue Department, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 25th October 1895, No. 124 C.E.

In continuation of my letter No. 171 C.E., dated 23rd November, 1894, I have the honour to enclose, for the sanction of Government, an estimate, amounting to Rs. 3,440, for the construction of an oil-launch.

2. The cost of the skin was somewhat more than anticipated in my former letter, owing to the fine lines of the boat, and the large number of bolts and nuts required.

3. On the other hand, the frame consists of such light pieces that the cost of its transport to Periyár was much less than expected.

ORDER—No. 937 I., dated 7th November 1895.

The following estimate is sanctioned :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
III. Tools and Plant.
4. Navigation Plant.

	RS.
Constructing an oil-launch, estimate	3,440.

2. This sanction is registered as No. 127 I. of 1895–96.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Superintendent of Works, No. I Periyár Division, with estimate.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O. No. 937 I., 7th Nov. 1895.

NOVEMBER.

Oil-Launch

Estimate of Rs. 3,440 for constructing an — for No. I Periyár division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 26th October 1895, No. 735 G.N.

I have the honour to submit herewith, for sanction, an estimate, amounting to Rs. 2,900, for purchasing scientific instruments and tools for the Rushikulya division, chargeable to "42. Major Works (Working Expenses)."

2. The Executive Engineer states that these instruments and tools were received in transfer from Ganjám division lately and their values will be credited in transfer to that division.

ORDER—No. 938 I., dated 8th November 1895.

The following estimates are sanctioned :—

Irrigation.
42. Major Works (Working Expenses).
Rushikulya Project.
5. Tools and Plant.

	RS.
(1) Scientific instruments and drawing materials—	
1. Purchasing scientific instruments	490
(3) Tools—	
2. Purchasing tools	2,410
Total ...	2,900

2. This sanction is registered as No. 128 I. of 1895-96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with estimate (3).
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O. No. 938 I., 8th Nov. 1895.

NOVEMBER.

Scientific Instruments and Tools

Estimates aggregating Rs. 2,900 for purchasing — for the Rushikulya division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 5th October 1895, No. 1496 G.D.

I have the honour to submit the usual annual statements connected with the working of staff boats in the Gódávari district for the official year 1894–95.

2. Subjoined is an abstract statement which exhibits the actual amount at credit of each existing boat and the amount required as per calculation laid down in G.O. No. 662 I., dated 26th August 1878.

Number of boat.	Original cost.	Actual at credit.	Required.
	RS.	RS.	RS.
12	820	523	820
13	820	367	820
14	1,400	1,768	1,400
15	800	456	800
16	1,250	1,230	1,250
17	850	1,267	850
18	1,400	1,627	1,283
19	850	829	779
20	1,400	944	1,050
21	840	393	630
22	1,783	644	892
23	2,411	360	603
Total ..	14,624	10,408	11,177

3. Statement A attached to this letter shows that the earnings realized up to the end of the past official year on the staff boats amount to Rs. 24,998 and the charges for the same period to Rs. 14,590. The amount therefore available for repairs and reconstruction is Rs. 10,408, or Rs. 9,726 exclusive of Rs. 682, which represents the deficit on boats already sold as per statement A-I. The balance remaining to the credit of boats on 31st March 1895 is Rs. 1,451 short of the amount calculated according to the standard laid down in G.O. No. 662 I., dated 26th August 1878.

4. The total receipts realized during the year under review were Rs. 2,259 ; while the total expenditure amounted to Rs. 1,605.

5. No staff boats were sold during the year.

6. The following statement shows the boats on which the receipts fell short of the outlay incurred during the year :—

Number of boat.	Receipts during the year.	Outlay during the year.	Amount at credit of boat to end of 1893–94.	Amount at credit of boat to end of 1894–95.	Difference.
	RS.	RS.	RS.	RS.	RS.
23	239	316	437	360	77

The difference on this boat is accounted for by the fact that she required extensive repairs and was occupied only for about eight months during the year.

Enclosures.

A.—Statement showing the date of completion, earnings, &c., of "Staff Boats" constructed, purchased, &c., in the Gódávari district, I Circle, for the official year 1894–95.

Boat number.	Class of boat.	Date of completion or purchase and cost. Year.	Amount.	Monthly rent.	Amount recovered up to end of March 1895, actual collections.	Amount spent on repairs up to end of March 1895.	Amount reserved for repairs and reconstruction up to end of March 1895.
1	2	3	4	5	6	7	8
			RS.	RS.	RS. A. P.	RS. A. P.	RS. A. P.
12	Second-class staff boat	1878–79	820	12	1,994 5 6	1,471 0 11	523 4 7
13	Do. do.	1879–80	820	12	1,854 13 7	1,487 13 1	367 0 6
14	First-class do.	1880–81	1,400	24	3,854 14 8	2,086 11 4	1,768 3 4
15	Second-class do.	1880–81	800	12 & 16	1,755 0 4	1,298 9 1	456 7 3
16	First-class do.	1882–83	1,250	24	2,958 11 11	1,728 10 6	1,230 1 5
17	Second-class do.	1882–83	850	16	2,019 0 8	752 5 2	1,266 11 6
18	First-class do.	1882–83	1,400	24	2,917 0 7	1,290 5 1	1,626 11 6
19	Second-class do.	1882–83	850	12	1,659 6 10	830 9 8	828 13 2
20	First-class do.	1885–86	1,400	24	2,313 13 11	1,369 6 7	944 7 4
21	Second-class do.	1885–86	840	12	1,447 6 2	1,054 5 0	393 1 2
22	First-class do.	1888–89	1,783	30	1,463 9 6	820 1 5	643 8 1
23	First-class do.	1892–93	2,411*	30	759 9 2	399 10 9	359 14 5
	Total ..	..	..	..	24,997 12 10	14,589 8 7	10,408 4 3

Rent for second-class staff boats is charged at Rs. 12 per mensem to subordinates drawing less than Rs. 200 per month (paragraph 1047-A of the Madras Public Works Code).

	RS.
* Value of upper part and fittings of No. 11 utilized for No. 23 (G.O. No. 50 I. of 16th January 1892)	440
Cost of improvements	1,971
	2,411

Dowlaishweram,
25th September 1895.

(Signed) C. J. USSHER,
Ex. Engr., Gódávari Eastern Division.

A-I.—Statement showing staff boats sold in the Gódávari district, I Circle, for the official year 1894–95.

Boats sold.	Surplus.	Deficit.	Amount reserved for repairs.
	RS. A. P.	RS. A. P.	RS. A. P.
Total brought forward from statement A, column 8 ..	..	..	10,408 4 3
Balance as per G.O. No. 930 I., dated 26th November 1894 ..	586 9 10	1,269 0 0	..
Boats sold in 1894–95	..	..	..
Total ..	586 9 10	1,269 0 0	682 6 2
Balance available for repairs and reconstruction ..	..	..	9,725 14 1

5th October 1895.

(Signed) A. H. GARRETT,
Superintending Engineer, I Circle.

Office-note to the Examiner of Public Works Accounts, dated 14th Oct. 1895, No. 261.
" from " " " " 24th " " No. 3722 D./A.

No. 206 I.

Submitted to Government.

6th November 1895.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

ORDER—No. 939 I., dated 8th November 1895.

Recorded.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O. No. 939 I., 8th Nov. 1895.

NOVEMBER.

Boats

Letter from Superintending Engineer, I Circle, submitting statements connected with the working of staff — in the Gódávari district for 1894–95, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 30th September 1895, No. 1482 G.D.

I have the honour to submit herewith the usual annual statements A, AI, B, C and D showing navigation receipts and charges of the Gódávari system of canals for the official year 1894–95.

2. The subjoined statement exhibits the receipts and charges of the year as compared with those of the preceding year:—

—	1894–95.	1893–94.	Increase.	Decrease.
Receipts.	RS.	RS.	RS.	RS.
1. License fees for Government boats	4,530	4,652	..	122
2. Do. for steamers and dredges	240	420	..	180
3. Do. for staff and jolly boats	147	147	..	..
4. Do. for passenger boats	3,193	3,452	..	259
5. Do. for cargo boats	24,405	36,537	..	12,132
6. Do. for steamers (private)	..	96	..	96
7. Do. for miscellaneous (including private and pleasure boats and fees for numbering boats) ..	920	800	120	..
8. Tolls on all kinds of boats and rafts	58,406	50,268	8,138	..
9. Rents of staff boats	2,259	2,458	..	199
10. Approximate navigation receipts from Kovur-Manjair junction canal credited to Incorporated Local and 43. Minor Works and Navigation	— 200	— 200	..	..
11. Profit on boat office	9,197	2,736	6,461	..
12. Refunds of navigation receipts	— 266	..	— 266	..
13. Rents of canal berms	795	294	501	..
Total ..	1,03,626	1,01,660	14,954	12,988
Charges.				
14. Navigation establishment including boat Superintendent ..	23,004	23,001	3	..
15. Lock and lock-weir repairs	26,755	22,690	4,065	..
16. Navigation buildings	1,823	833	990	..
17. Tow-path maintenance	1,506	2,150	..	644
18. Dredging	5,725	4,178	1,547	..
19. Share of canal maintenance	16,963	13,983	2,975	..
20. Repairs of staff boats	1,605	1,808	..	203
21. Miscellaneous including any charges not appertaining to the above items	3,880	2,353	1,527	..
Total ..	81,261	71,001	11,107	847

Receipts.

3. The decrease on items 1 and 2 is due to boat No. 45, and one Priestman's dredge not having been licensed during the year under review.

4. The decrease on item 4 is trifling and calls for no explanation.

5. The decrease on item 5 is due to the large number of boats plying on toll tickets (*vide* item 8).

6. The decrease on item 6 is due to private steamers not having been licensed during the year.

7. The increase on item 7 is due to fee taken for painting numbers on boats plying on toll tickets. In previous years separate numbers were not given to vessels plying on toll tickets.

8. The increase on item 8 is due to more boats plying on toll tickets in preference to licenses (*vide* item 5).

9. The decrease on item 9 is due to some of the boats not having been used for some time during the year.

10. The increase on item 11 is due to the demand for steamers and other vessels for State Railways, Local funds, &c., being greater than in the previous year.

11. The increase on item 13 is due to the increased occupation of canal berms.

Charges.

12. The increase under item 15 is due to replacement of several lock gates including the gates of Mogaltur tail lock.

13. The increase on item 16 is due to large number of lock establishment quarters having been repaired during the year.

14. The decrease under items 17 and 20 is due to expenditure of previous year being heavy.

15. The increase on item 18 is due to silt clearance below Narsapur and Yelúrpad tail locks having been carried out this year.

16. The increase on item 19 is due to increased maintenance charges to delta works in general.

17. The increase on item 21 is due to extensive repairs to Allaram aqueduct and Vridha Gowtami under-tunnel which were seriously damaged by the rain storm of November 1893.

18. It will be seen from statement D that during the year under review punishments in 61 cases were inflicted for infringement of Navigation Rules against 77 cases in the previous year. Of this number, 23 cases were on account of rafts of larger dimension than 90 feet in length by 12 feet in breadth or of more than 2 feet draught plying on canals.

Enclosures.

A.—Statement of Receipts and Charges, Gódávari Delta Navigation, for the official year 1894–95.

Receipts for the official year 1894–95.		Charges for the official year 1894–95.	
Description.	Amount.	Description.	Amount.
	RS.		RS.
License fees for Government boats ..	4,530	1. Navigation establishment including boat Superintendent	23,004
Do. for steamers and dredges ..	210	2. Lock and lock-weir repairs	26 755
Do. for staff boats and jolly boats ..	147	3. Navigation buildings	1,823
Do. for passenger boats	3,193	4. Tow-path maintenance	1,506
Do. for cargo boats	24,405	5. Dredging	5,725
Do. for steamers (private) ..	..	6. Share of canal maintenance	16,963
Do. for miscellaneous including private boats and pleasure boats and duplicate license fees	394	7. Repairs of staff boats	1,605
Tolls on Government steamers and dredges ..	..	8. Charges for painting numbers on boats ..	337
Do. on passenger boats	9,418	9. Miscellanous (including charges not appertaining to the 1st eight items) ..	3,543
Do. on cargo boats	33,286		
Do. on private steamers	163		81,261
Do. on miscellaneous	147	Interest at 2 per cent. on capital outlay during the year on navigation works proper ..	20
Do. on rafts	* 15,392		
Rents collected from staff boats	2,259	Interest for the year on capital outlay on navigation works proper to end of 1893–94 at 4 per cent.	42,192
Fees collected for painting numbers on boats.	526		
Approximate navigation receipts from Kovur-Manjair junction canal credited to Incorporated Local and 43. Minor Works and Navigation	— 200		
Profit on boat office at end of 1894–95 ..	9,197		
Refunds of navigation receipts	— 266		
Rents on canal berms	795		
	1,03,626		
Loss ..	19,847		
Total ..	1,23,473	Total ..	1,23,473

* This does not include Rs. 53 the amount of fines collected on rafts for infringement of Navigation Rules in the Gódávari Western Division.

A-I.—Statement of capital outlay on Navigation Works proper of the Gódávari delta from the year 1870–71 inclusive.

Sections of delta.	To end of 1893–94.	For 1894–95.	Total.
	RS.	RS.	RS.
Eastern delta	3,46,783	981	3,47,764
Central ,, ...	2,58,174	..	2,58,174
Western ,, ...	4,49,832	..	4,49,832
Total ..	10,54,789	981	10,55,770

B.—Statement showing the Navigation Receipts for the official year 1894–95.

Particulars.	Official year 1893–94.					Official year 1894–95.				
	Class.	Total number.	Measured tonnage licensed at 50 cubic feet per ton.	Number of passengers licensed to carry.	Amount of license fees and tolls.	Class.	Total number.	Measured tonnage licensed at 50 cubic feet per ton.	Number of passengers licensed to carry.	Amount of license fees and tolls.
					RS.					RS.
License fees for Government boats.	..	63	1,861	..	4,652	..	62	1,812	..	4,530
Do. for steamers and dredges.	..	3	84	..	420	..	2	48	..	240
Do. for staff boats and jolly boats.	1st & 2nd	15	..	..	147	1st & 2nd	15	..	..	147
Do. for passenger boats ..	1st	..	..	..	..	..	..	..	..	..
Do. do. ..	2nd	60	1,231	2,980	3,452	2nd	61	1,251	3,102	3,193
Do. for cargo boats ..	..	672	16,825	..	36,537	..	440	11,206	..	24,405
Do. for steamers, private ..	..	1	24	..	96	..	..	..	..	..
Do. for miscellaneous (including private boats and pleasure boats and duplicate license fees).	..	65	..	..	527	..	58	..	..	394
Tolls on Government steamers and dredges.	..	..	..	..	163	..	..	..	..	..
Do. on passenger boats	..	..	..	..	10,953	..	..	..	..	9,418
Do. on cargo boats	..	..	..	..	25,430	..	..	..	..	33,286
Do. on miscellaneous	..	..	..	..	73	..	..	..	..	147
Do. on rafts	..	..	..	..	13,447	..	..	..	..	15,392
Rents collected from staff boats ..	..	..	..	..	2,458	..	..	..	..	2,259
Tolls on private steamers ..	..	..	..	..	202	..	..	..	..	163
Fees collected for painting numbers on boats.	..	..	..	..	273	..	..	..	..	526
Approximate navigation receipts from Kovur-Manjair junction canal credited to Incorporated Local and 43. Minor Works and Navigation.	..	..	..	..	— 200	..	..	..	..	— 200
Profit on boat office	..	..	..	..	2,736	..	..	..	..	9,197
Refunds of navigation receipts ..	..	..	..	..	..	..	..	..	..	— 266
Rents on canal berms	..	..	..	..	294	..	..	..	..	795
Total ..	..	879	20,025	2,980	1,01,660	..	638	14,317	3,102	1,03,626

C.—STATEMENT showing the total maintenance charges on Navigable Canals of the Gódávari delta for the year 1894–95.

Description.	Total charges for 1894–95.	Debitable to Navigation. Rate.	Debitable to Navigation. Amount.	Debitable to Irrigation. Rate.	Debitable to Irrigation. Amount.
	RS.	RS.	RS.	RS.	RS.
1. Navigation establishment	23,004	Whole.	23,004	..	..
2. Locks and weirs repairs	26,755	..	26,755	..	..
3. Navigation buildings	1,823	..	1,823	..	..
4. Tow-path maintenance	1,506	..	1,506	..	..
5. Dredging	5,725	..	5,725	..	..
6. Share of canal maintenance	(a) 67,853	¼	16,963	¾	50,890
7. Repairs to staff boats	1,605	Whole.	1,605	..	..
8. Charges for painting numbers on boats	337	..	337	..	..
9. Miscellaneous (including charges not appertaining to the first eight items).	(b) 14,171	¼	3,543	¾	10,628
Total ..	1,42,779	..	81,261	..	61,518

(a) This amount represents expenditure on the following items:—

(1) Repairs to canal banks (one-fourth of this is chargeable to navigation).
(2) Silt clearances (one-fourth of this is chargeable to navigation).
(3) Mile and avenue coolies (one-fourth of this is chargeable to navigation).

(b) This item represents expenditure on repairs to masonry works other than locks and weirs (one-fourth of this is charged to navigation).

D.—Memorandum showing the offences against Navigation Rules and Regulations during the official year 1894–95.

Nature and description of boats.	Rule 1—for plying on canal without a toll ticket or license.		Rule 7—for refusing to convey all passengers for whom there is room according to the rules irrespective of caste.		Rule 9 (1 and 2)—for refusing to convey passengers when required to do so in preference to cargo; for conveying greater quantity of cargo than registered tonnage.		Rule 19—for plying on canal rafts of larger dimension than 90 feet in length by 19 feet in breadth or of more than 3 feet draught.		Rule 20—for not having a sufficient board.		Rule 22—for unloading cargo at lock.		Rule 23—for stocking goods on canal lands.		Rule 25—for mooring vessels within limits fixed by notice board.		Rule 26—for not having a man in charge and for not having light and masts down when moored; also for not mooring fast stem and stern to the bank in a single line.		Rule 27—for not having a light on boat or raft.		Rule 31—for interfering with lock gearings, &c.		Rule 33—for not having always a ticket licence on board and for not producing it when called for by any duly authorised officer for examination.		Rule 36—for damaging the works of canals.	
	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.	Boat number.	Number of days stopped.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Passenger boats ..	T. 43728 T. 43778	7 6	L. 5817	7	5832 217 T. 49556 L. 5842 T. 44067	7 4 7 4 1	..	..	5801 T. 44160 T. 35854 619 L. 1881 L. 5833 L. 5803 L. 5842 689	7 2 3 2 3 7 7 7 3	5514	3	T. 42992	8	T. 44256 T. 43049 T. 43024 T. 43042	1 10 3 3	T. 43231	4	T. 43790 T. 43742	3 3	T. 38269 5808 999 5833	7 7 6 6	T. 49502	7	5819	6
Cargo boats	..	..	..	..	..	..	..	..			..	..	..	..	G. 229 G. 236	5 5	T. 38373 T. 43931 T. 43232	7 2 4	..	..	L. 5745	7				
Rafts	..	..	..	..	..	..	T. 33953 33954 33955 33956 33957 33958 33959 33960 33961 33962 33963 33964 33965 36990 36991 36992 36993 36994 36984 36985 36987 36988 36989	Fined one rupee each under Rule 40.																		

Office-note to the Examiner, Public Works Accounts, dated 8th Oct. 1895, No. 255.
" from " " " 24th " " " 3723 D./A.

No. 207 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

6th November 1895.

Order—No. 940 I., dated 8th November 1895.

Recorded.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated Novberem, 8th.

Recd. *Encl.*

G.O. No. 940 I., 8th Nov. 1895.

NOVEMBER.

Canals

Letter from Superintending Engineer, I Circle, submitting statements showing the navigation receipts and charges of the Gódávari system of — for 1894–95, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

Telegram from the Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, dated Simla, 5th November 1895, No. 76-A.I.

Your telegram 1st instant. Additional grant Rs. 93,000 sanctioned under 42.

ORDER—No. 941 I., dated 8th November 1895.

Communicated to the officers concerned with reference to G.O. No. $\frac{914}{A}$ I., dated 1st November 1895.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O. No. 941 I., 8th Nov. 1895.

NOVEMBER.

Kistna Delta System

Government of India telegram sanctioning an additional grant of Rs. 93,000 under "42" —, communicated to officers concerned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper:—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 29th October 1895, No. 550 V.Z.

I have the honour to bring to your notice that an estimate, amounting to Rs. 900, for "repairing Godari anicut across Sarada river" has been received from the Executive Engineer, Vizagapatam Division.

2. The estimate has been countersigned by the Collector, Vizagapatam district.

3. One-third of the cost of the estimate amount will be borne by Government and two-thirds by the proprietors of Anakápalle and Kasimkóta.

4. The Executive Engineer reports that the Collector has stated that the proprietors of Anakápalle and Kasimkóta are willing to pay their share of contribution.

5. I therefore request that sanction of Government may be obtained under paragraph 79, chapter IX, volume I, of the Public Works Code, to the work being carried out by this department.

Order—No. 942 I., dated 8th November 1895.

The execution, by the Public Works Department, of the work referred to is sanctioned.

2. Work should not be put in hand until the contributions from the proprietors of Anakápalle and Kasimkóta have been paid into the treasury.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O. No. 942 I., 8th Nov. 1895.

NOVEMBER.

Godari Anicut

The execution, by the Public Works Department, of the contribution work of repairing — across Sarada river, Vizagapatam division, sanctioned with remark.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Superintending Engineer, IV Circle, dated 8th May 1895, No. 93 E.I.
To the " " " " 12th June 1895, No. 41 N.A.

From J. HANNAN, Esq., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, 30th September 1895, No. 211 I.

With reference to your memo. No. 41 N.A., dated 12th June 1895, I have the honour to submit, for sanction of Government, the plans and revised estimates, amounting to Rs. 2,660, for constructing two lascars' huts at each of the two places, Chengadu and Kovilur, instead of one at each place, as originally proposed, and for constructing an inspection bungalow at No. 3 Regulator in Cheyar main channel, together with reports explaining the necessity for the works.

With reference to paragraph 1 of your memorandum under reference, it is observed that the estimates were correctly classed under "Open Capital Account" as all the revised estimates of the project were sanctioned under the same head in G.O. No. 855 I., dated 6th October 1893. If it is considered incorrect the necessary corrections may be made in your office.

Paragraph 2.—The estimates were classed under "Buildings" as all the buildings now estimated for are to be constructed along, and for the safety of, the main channel (*vide* appendix II, page LXII, Volume II, of Public Works Department Code).

Paragraph 3.—The Division officer is unable to suggest a source from which the above sum of Rs. 2,660 can be met with. The probable savings on masonry works of the system, viz., Rs. 2,250, including the savings of Rs. 1,000 effected by revising the work 8, 9 and 10, will be required to meet the excess of Rs. 4,743 which has already been incurred under the sub-head "Earthwork." It is further to be noted that there is no provision for unforeseen works in the revised estimates sanctioned in G.O. No. 855 I., dated 6th October 1893.

I would therefore request that funds from some other source may be provided for the buildings under reference, which are very necessary.

Enclosures.

Report to accompany an estimate for constructing two lascars' huts at No. 2 Regulator.

	RS.
Amount of estimate is	670

No. 2 Regulator, sanctioned in G.O., No. 855 I. of 6th October 1893, is situated at the east end of Chengadu Naickeneri tank. It has three vents 8 × 6 and two vents 6 × 6, the former two being very heavy and exceedingly difficult to work against considerable head of water.

2. The place is liable to sudden floods from cross drainage, and it is necessary to be able to ensure the rapid manipulation of the shutters of the regulator, so that it would be dangerous to have the lascars living at any distance (say Kovilur, so as to work this regulator and Nos. 3 and 4).

3. The huts will be built at the toe of the left bank 93 feet below the lower parapet of the regulator.

Work to be carried out in accordance with standard specifications.

(Signed) H. E. CLERK,
Ex. Engr., North Arcot Divn.

REPORT to accompany an estimate for constructing two lascars' huts at No. 3 Regulator, Cheyar main channel.

	RS.
Amount of estimate	670

Nos. 3 and 4 * Regulators stand at the south side of Kovilur tank at a distance of at least 2 miles from the nearest village, Kovilur. These head the two main branches of the channel, the first commanding the supply to Tettray and Purusai, and the second that *viâ* Ayalvadi to Wandiwash and the tanks east and south of it. It is therefore of the first importance to have these two regulators carefully watched to prevent the ryots having lands under these regulators from tamping with them.

* Sanctioned in G.O. No. 855 I., dated 6th October 1893.

Hence this estimate which provides for a hut † to be built to the south or right of No. 3 Regulator on Government poramboke above the waterspread of Kovilur tank and which is to be carried out strictly in accordance with standard specification.

† Two huts have now been estimated for as it was since settled with the Superintending Engineer that two lascars should be stationed there.

26th April 1895.

(Signed) W. V. BAKER,
Offg. Ex. Engr., North Arcot Divn.

REPORT to accompany the estimate for constructing an "Inspection Bungalow" at No. 2 Regulator, Chengadu, Wandiwash Taluk.

	RS.
Amount of estimate	1,320

There is an inspection bungalow below Valkodai which is not a very convenient place for inspection not having at present any important works near it that require continual attention, except No. 1 Regulator.

From Valkodai in wet weather an inspecting officer has to go right on to Wandiwash or pitch a tent at the risk of not being able to strike it for a week, *e.g.*, Executive Engineer's inspection in September, and Superintending Engineer's and Executive Engineer's in December last, so that one of the most important parts of the work, the distribution of the three main branches of Ayalavodi, Purasai and Tettray, have often to be left unseen or inspected at great inconvenience.

Nos. 3, 4 and 5 ‡ (division regulator substituted for old No. 5) are all handy and must have constant attention to guard against fraud in the distribution of water.

‡ Sanctioned in G.O. No. 855 I., dated 6th October 1893.

The position, chosen after careful thought as the best, is the high ground to right of No. 3 Regulator, bordering on Kovilur tank. This is about a furlong or two from the main road and on the bandy-track from Valkodai *viâ* Kolathur and No. 5 Bridge.

The Kovilur tank is one of the largest tanks in the sub-division (Arni) and the situation will be pleasant, as the borders of the tank are not made nuisance by decaying vegetation, &c., the slopes being steep.

Economy has been consulted as much as is safe, but it is likely there will be a saving in concrete as the foundation is rocky very near the surface.

The work is to be carried out strictly by standard specification.

The distance by road is 9 miles from Valkodai and 11 from the anicut and 7 from Wandiwash.

By bandy-track, almost unpassable in wet weather, the distance from Valkodai is about 7 miles cross cuts.

26th April 1895.

(Signed) W. V. BAKER,
Offg. Executive Engineer.

No. 204 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

4th November 1895.

ORDER—No. 945 I., dated 11th November 1895.

The following estimate is sanctioned:—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Cheyar Anicut System.
Capital Account.
(2) Main Canals and Branches.
11. Buildings.

		RS.
(1)	Constructing two lascars' huts at No. 2 Regulator	670
(2)	Do. do. at No. 3 do.	670
(3)	Do. inspection bungalow at No. 2 Regulator	1,320
	Total I. Works ...	2,660
	II. Establishment ...	612
	III. Tools and Plant ...	8
	Total estimate ...	3,280

2. This sanction is registered as No. 130 I. of 1895-96.

3. The Superintending Engineer will report what funds are required during the current year.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, IV Circle, with nine enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 11th.

Recd. *Encl.*

G.O. No. 945 I., 11th Nov. 1895.

NOVEMBER.

Inspection bungalow and Lascars' huts

Estimates aggregating Rs. 3,280 for constructing — in connection with the Cheyar anicut system, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 21st September 1895, No. 630 G.N.

I have the honour to submit herewith, for sanction, plans and estimates, amounting to Rs. 13,730, received from the Executive Engineer, Rushikulya Division, for the works connected with No. 7 distributary from 34⅜ miles, Rushikulya canal, as per enclosed classified abstract.

2. It is estimated that 9,200 acres are commanded by the channel as explained in the report accompanying the estimate. There will be four reaches on the main channel, but the present estimate is only for the first two reaches, *i.e.*, up to 6¼ miles.

3. The discharges of flush outlets at 6 furlongs 300 feet, 1 mile 3 furlongs 107 feet, 2 miles 2 furlongs 550 feet, 3 miles 1 furlong 250 feet, 3 miles 7 furlongs, 4 miles 3 furlongs 147 feet, 6 miles 330 feet, are somewhat over-estimated owing to the Executive Engineer taking four-fifths instead of two-thirds of the tabular discharge as noted on the plan.

4. The amount of the estimates is properly debitable to items * 286, 307 and 315 of the comparative statement, printed in Proceedings of the Madras Government, No. 13 I., dated 10th January 1894, as shown in the classified abstract.

* Head sluice to item 286, other masonry works to item 307, earthwork and fixing demarcation stones to item 315.

ENCLOSURES.

No. 7 Distributary, Rushikulya Canal.

Takes off at 34⅜ miles from the left bank of canal. Bed level here is M S.L. + 144·27.

2. About 18·24 square miles of country are commanded by the distributary, and deducting for high lands, village sites, &c., 500 acres per square mile may be taken as the ultimate irrigable area. This will amount to about 9,200 acres.

3. The duty of a cubic foot of water is taken at 100 acres.

4. For the present it is only contemplated to supply 7,000 acres, leaving a berm of 8′ to allow of widening to ultimate size. Masonry works are designed to pass the full supply for ultimate area.

5. There will be four reaches on the main channel according to the statement now submitted. The present estimate is for the first two reaches, *i.e.*, up to 6¼ miles.

6. At 8⅛ miles the channel will cross the existing Jayamangalam channel, and running parallel with the Rushikulya river will irrigate the low lands between the Jayamangalam channel and that river. On this point a further report will be sent when dealing with the third and fourth sections.

7. At 5 miles + 350′, the distributary crosses the supply channel to the inam tank of Sompúr. This channel is a small and well defined course, and may be passed under No. 7 by an earthenware pipe 1½′ diameter.

To admit of the work being pushed on as rapidly as possible, it is requested that the estimates may be sanctioned by reaches, as was done in the case of the Ichhapur channel, and the eathwork of the first two reaches has been put in hand in anticipation of sanction.

(Signed) W. C. DEMORGAN,
Executive Engineer, Rushikulya Divn.

19th August 1895.

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	FAMINE RELIEF AND INSURANCE.	RS.	RS.	RS.	RS.
	35. *Construction of P. I. Works.*				
	Rushikulya Project.				
	Rushikulya Division.				
	Rushikulya Canal.				
	I. Works.				
	3. Distributaries.				
	Distributary No. 7 from 34⅝ miles of Rushikulya Canal from 0 to 6¼ miles.				
1. Preliminary expenses.	1. Preliminary expenses	200	* 200		
3. Works ..	2. Sluice to distributary No. 7	† 990			
	3. Flush outlet at 2 furlongs and 606 feet	120			
	4. Do. at 6 ,, and 300 ,, ...	280			
	5. Do. at 1 mile 3 furlongs and 107 feet ..	200			
	6. Do. at 2 miles 2 furlongs and 550 feet ..	410			
	7. Do. at 3 ,, 1 furlong and 250 feet ..	280			
	8. Do. at 3 ,, 7 furlongs	‡ 400			
	9. Do. at 4 ,, 3 ,, and 147 feet ..	‡ 200			
	10. Masonry outlet at 4⅞ miles	360			
	11. Pipe to carry small channel at 5 miles and 350 feet ..	300			
	12. Drop No. 1 at 5¼ miles and 220 feet	770			
	13. Do. No. 2 at 5½ ,, and 440 feet	770			
	14. Flush outlet at 6 miles and 330 feet	290	5,370		
4. Earthwork.	15. Excavating channel	8,100	* 8,100		
5. Miscellaneous.	16. Demarcation stones	330	* 330		
				14,000	

* To be met from item 315 of the comparative statement, printed with G.O. No. 13 I., dated 10th January 1894.
† Do. 286 do. do. do.
‡ Do. 307 do. do. do.

DOWLAISHWERAM,
21st September 1895.

(Signed) A. H. GARRETT,
Superintending Engineer, I Circle.

No. 203 I.

Submitted to Government with a recommendation that the estimates, as raised in this office from Rs. 13,730 to Rs. 14,000, be sanctioned. The increase of Rs. 270 is due to the lengths of the proposed outlets being increased.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

4th November 1895.

ORDER—No. 946 I., dated 11th November 1895.

The estimates, aggregating Rs. 14,000, for No. 7 distributary from 34⅝ miles, Rushikulya canal, are sanctioned, the proposed outlay on item 2 of the classified

abstract estimate, items 3 to 14 and items 1, 15 and 16 being met, respectively, from the provision made for items 286, 307 and 315 of the comparative statement printed in Proceedings of Madras Government No. 13 I., dated 10th January 1894.

2. This sanction is registered as No. 129 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle, with plans and estimates (32).
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras

PUBLIC WORKS.

Dated November, 11*th*.

Recd. *Encl.*

G.O. No. 946 I., 11th Nov. 1895.

NOVEMBER.

Rushikulya Canal

Estimates aggregating Rs. 14,000 for No. 7 distributary from $34\frac{3}{8}$ miles, —, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 1st May 1895, No. 78 N.L.

In reference to your No. II/64 N.L. of 1st September 1894, I have the honour to forward plans and estimates for improving the supply to the Nellore tank and strongly recommend that the work be carried out as soon as possible.

2. The village maps, with the level of each field included in the increase of cultivation, have been forwarded to the Collector with a request that he will send them on to you with his remarks. The maps only show the new cultivation which may be expected, viz., about 5,000 acres, as there appears to be no object in delineating the existing usual wet under the tank, or the lands commanded by the Pennéru anicut. All the fields coloured red in the maps are dry lands which will be converted into wet.

3. The financial aspect of the project is good, for it will be seen from the report that the return expected is nearly 7 per cent. on the capital outlay, and the land available is said to have already been taken up.

4. The scheme provides for an additional supply to the Nellore tank by means of a head sluice above the Sangam anicut and a channel leading to the existing tank supply channel. So far the nature and extent of work to be carried out is clearly indicated in the report and in the plans and estimates.

5. The distribution of supply to the new lands may, however, with advantage, be briefly explained. By using the existing Kumball sluice and channel of the Nellore tank, the whole supply required for the new lands is taken to a regulator situated just beyond the proposed aqueduct which will carry the Kumball channel over the

Saravapalli canal. The following table shows the distribution of the channels from the regulator:—

No. I. Branch channel ...	Minor branch channel A.	Sub-branch channel C.
		Sub-branch channel D.
	Minor branch channel B.	
No. II. Branch channel.		
No. III. Branch channel.		

6. The designs of the masonry works have been submitted in pencil for facility of alteration if required. If approved, they will be inked in with black lines for reproduction by the ferro-prussiate process.

7. Full explanation regarding the project is given in Mr. Marjoribank's report and in his letter No. 16 S.E. of 10th April 1895, and as regards the cost of maintenance I do not think the 8 annas per acre allowed in the financial forecast is excessive.

ENCLOSURES.

REPORT to accompany the plans and estimates for the Nellore Tank Project.

	RS.
Amount of estimate	2,10,000

The estimate provides for a supply channel to the Nellore tank from above the Sangam anicut on the right bank of the Pennéru to ensure a supply during the months of June, July and August for the cultivation of 12,000 acres, more than half of which at present are left uncultivated owing to the present defective supply from the river. During the three succeeding months the supply is ample, but in the absence of a supply from the river in the earlier months, the later freshes cannot be fully utilized, nor the available ayacut under the tank brought under cultivation.

Vide this office No. 225 N.L., dated 21st June 1894.

2. *Natural situation of the tank.*—Nellore is situated in what appears to have been an ancient coast line before the formation of the present delta. The Narasimha hill, about seven miles to the west, is an ancient cliff, and a laterite bank, which may have once been an ancient coastal reef, leads up to Nellore from the south-west. The Pennéru river runs from east to west immediately north of this; but it is shut off by a slip of high bank partly natural, partly artificial, which, with the laterite bank above mentioned, forms a triangular depression, which is the Nellore tank.

3. *Sources of supply.*—It has two sources of supply—the rainfall discharge from its natural basin, 19·50 square miles in extent, and the Pennéru river. The supply from the Pennéru river is effected by means of a corumboo dam just above the Zonnavada gorge, and a channel 10 miles long. This channel has an open head D, about a mile above the Gollakandukur Lodum, a natural drainage stream into the Pennéru, and is 8 miles long. Seven miles down a masonry head sluice with shutters has been built sill level 59·05 (datum = M.S.L. + 4·22). The sill level of the head sluice is 10 feet above the bed of the river, which must therefore be in very considerable fresh before water can be sent down to the tank. This involves a great waste of water running to the sea over the Nellore or (lower anicut). The construction of the Sangam anicut, while utilizing much of this waste, diminished the volume and height of the freshes, and consequently impaired the effectiveness of the Nellore tank supply channel. The corumboo, moreover, was maintained with difficulty owing to the velocity and depth of water flowing over it.

4. It is evident therefore that the take-off of the channel should be much higher up the river. Even before the construction of the anicut at Sangam, the necessity for this was recognized, and attempts were made to remedy the defect. The supply channel was deepened and widened and the sill of the head sluice raised by one foot; outlets were built in the left bank to provide for cross drainage from F to E, but the defect was radical and no real improvement has been effected thereby, though over Rs. 40,000 were spent in the work. Constant petitions were sent in by the ryots, and as a partial relief the tank was reduced from first to second class. The ryots reduced their cultivation of peshanum crop from 54 per cent. in 1874 to 12 per cent., at which figure the ratio of peshanum to other crops has remained fairly constant.

5. *River Pennéru.*—The Pennéru river rises in the Nandidrug hill of Mysore and enters the Nellore district at Someswaram where it pierces the eastern ghâts and discharges into the sea 19 miles below Nellore after a course of 355 miles. The drainage area of the river is 20,248 square miles (see statement A) lying in Mysore Province, and the districts of Bellary, Anantapur, Cuddapah, Kurnool and Nellore. Of this area, 18,008 square miles is under the predominating

influence of the south-west monsoon and 2,240 under the predominating influence of the north-east monsoon (*vide* statement C). Of these districts, Bellary and Anantapur receive the least, then come in ascending scale Cuddapah Kurnool and Nellore. The south-west monsoon rainfall is irregular and the freshes are scanty, giving to the Pennéru the character of a large jungle stream during those months. The upper Pennéru and Kundu basins are the sources of supply during June, July and August, but the rainfall is fitful and direct irrigation is difficult, while on the other hand storage is easy. On the other hand, during the north-east monsoon, the flow in the river is more or less constant, water flowing over the Nellore anicut 79 days during the four months September to December (see statement B).

6. The chances of very heavy floods are greater during the south-west monsoon owing to the fact that the greater part of the basin is influenced by it, as compared with the north-east, which the north-east monsoon floods unless they are swollen by the contents of breached tanks, are much less sudden and high. The maximum flood in the river in September 1874 was due to heavy rainfall in Kundu basin, and the flood of 1879, which was only one foot lower, was due to heavy rain in the upper Pennéru basin in May. The heavy flood of 1882 in the north-east monsoon was partly due to the breaching of several tanks in the Bellary district. In the Nellore district the rainfall on the basin of the Pennéru is chiefly due to the north-east monsoon, and this part of the basin, together with a portion of Cuddapah, is affected by cyclones which do not vex those portions where the south-west is the predominating monsoon.

7. *Supply available.*—The average discharge over the Nellore anicut from 1877 to 1894 was 139,356 millions of cubic feet. The quantity of water required for a five months' crop for 12,000 acres is (12,000 × 0·216 millions of cubic feet) = 2,592 millions of cubic feet. Thus the supply is ample. The ryots, however, even when water is available for a peshanum crop, generally cultivate a proportion, roughly speaking 25 per cent. under inferior crops, for payment to labourers in kind. The quantity of water therefore required for 9,000 acres is three-fourths of 2,592, that is, 1,944 millions of cubic feet. But this is for a five months' crop. As water will only be required during July and August, and cultivation is gradual, while some supply may be looked for from the rainfall on the catchment basin, the total quantity that is required is 648 millions of cubic feet being assumed to be one-third of the total supply—1,944 millions. It will be seen from statement B that water flows over the Nellore anicut for fifteen days during June, July and August, on the average. The channel therefore must discharge $\frac{648,000,000}{15 \times 24 \times 60 \times 60} = 500$ cubic feet a second. It should clearly be understood that this channel would only fulfil its purpose during average years. It would be useless during such a year as 1891.

8. *The channel.*—This is 6 miles 4½ furlongs long. It will have a bottom width of 40 feet and will flow 5 feet deep with a fall of 1 foot a mile, side slopes 1½ to 1. It will fall into the Gollakandukur channel or DeButt's channel which will be widened to 28 feet bottom width, the existing fall being 2 feet a mile; this will discharge into the Nellore tank supply channel after a course of 7 miles. The tank supply requires no modification.

9. *Masonry works.*—(1) Head sluice. This is situated just above the left flank of the Sangam anicut (right bank of Pennéru). It is designed with a greater discharging capacity than is necessary with a view to future possible demands on it. No scouring sluices are provided as the position of the sluice is favourable, and there is a low water-course close to the left flank to the anicut which is permanent.

(2) and (3) Aqueducts at 0 mile 2 furlongs and 0 mile 4 furlongs which carry the Mahamadapuram-Tatiparti and Virur river channels over the proposed channel.

(4) Syphon at 3 miles 5½ furlongs under the Gollakandukur Lodum.

(5) Drop and syphon at 5 miles 3½ furlongs to carry the surplus of the Tatiparti tank over the proposed channel.

(6) Drop at 6 miles 4½ furlongs, where the channel ends.

10. *Tank.*—The tank has a catchment area of 19½ square miles, a water-spread of 5 square miles (F.T.L. 64·50), capacity of 836 millions cubic feet and an average depth of between 5 and 6 feet. The sill of the low level sluice is 49·27. The bund is 3½ miles long, admirably revetted with cut laterite and in very good order. For the discharge of the rainfall from the basin there are two weirs. There are four sluices (i) sluice with sill at 54·44. This supplies water to Pottiapolliem and a portion of Nellore about 500 acres.

(ii) Kumball sluice sill level 54·40; this was originally meant to supply the moat of Nellore fort, and had no irrigation under it; now it supplies water for 600 acres, though it is capable of supplying 5,000 acres more. This sluice and channel will take off the supply for all the new cultivation, viz., about 5,000 acres.

(iii) Guddi, or low level sluice, sill level 49·27. This supplies water for the villages of Nellore, Kondayapaliem, Kanupartipaud, Allipuram, Chintareddipaliem and Gudipallipaud (5,000 acres).

(iv) Sluice in surplus weir sill 54·78. This irrigates a portion of Nellore fields in Durgamitta, Kondayapaliem and Kanupartipaud villages about 1,200 acres.

11. It is now proposed to supply the extra 5,000 odd acres from the Kumball sluice, which will be improved for the purpose. This channel enters the ditch at 1 mile 7 furlongs of its course, and leaves it at 2 miles 4 furlongs. It will cross the Saravapalli canal at 3 miles by a (proposed) masonry aqueduct. At present there is a small iron trough aqueduct, but this is insufficient in section. Up to the Saravapalli canal the channel requires banking here and there, and three road culverts have to be improved (*i.e.*, widened). After crossing the Saravapalli canal, a regulator will be built at 3 miles, where the channel will branch into three minor branches numbered 1, 2 and 3, respectively. Up to the regulator the fall will be a little over 2 feet a mile (6·40 in 3 miles).

12. *Branch channel No. I.*—This irrigates 3,276 acres and runs parallel to the Saravapalli canal for half a mile and will cross the Jaffer Sahib's at 1 mile. At 1 mile 5½ furlongs it throws off a branch A, which, after irrigating the high level fields of Allipuram, crosses Jaffer Sahib's canal again at 2 miles 3 furlongs below Allipuram regulator. The minor branch again branches into two C and D one at 2 miles 4 furlongs, the other at 2 miles 7½ furlongs for irrigating the high level fields of Gudipallipaud. The main branch channel A crosses the Kodur road at 3 miles 4⅓ furlongs and irrigates the garden lands between the Kodur road and channel. The total length of the minor branch channel A is 4 miles. Branch channel No. 1 again throws off a minor branch B at 4 miles 0⅓ furlong to irrigate the high level fields of Kodurpaud and Labur. Branch channel No. 1 ends in Labur after a course of 5 miles.

13. *Branch channel No.* 2.—This is an old channel called Kondareddichinna channel. Masonry works, drops and regulators will be built on this channel to ensure proper distribution, and the channel itself will be extended by half a mile to supply the high level fields of Allipuram, Chintareddipaliem and Cherukur, to an extent of 1,200 acres. No provision is made for earthwork of the old channel, as the present width of 5 feet is more than sufficient.

14. *Branch channel No.* 3.—This is about 3 furlongs long and joins an old high level channel called Oravollu which is not now used. The extent of irrigation is 250 acres.

15. *Capacity of tank.*—The extent of land that can be brought under cultivation (see paragraph 1) depends on the supply from the river and the capacity of the tank. The supply channel is designed to carry one-third of the supply required for three-fourths of its ayacut in 15 days; this enables the ryots to raise peshanum or other superior rice crop in July and August. During October and November supply is ample as water is available for 24 days in the month on an average. The river begins to fall in normal years at the end of December and practically no water is available from January onwards; but water will have to be supplied for irrigation under the tank till the end of February when all the crops are harvested. But the tank can be kept full by supply from the river till the end of December (in normal years), as water is available on the average for 14 days during that month. Thus the tank must hold a supply enough for two months for the ayacut under it, that is, 12,000 acres. The quantity of water required for a 5 months' crop is 2,592 millions of cubic feet (see paragraph 7) for 2 months; with economy one-third of this supply will be sufficient. This amounts to 864 millions of cubic feet, the capacity of the tank being 836 millions or a little more.

16. *Land available.*—The following statement shows the land that is available, and is the result of careful levelling :—

Villages.	Figures by Revenue Department.	Figures by Public Works Department.
1. Nellore	988	1,040
2. Allipuram	952	907
3. Gudipallipaud	522	1,163
4. Labur	...	560
5. Pedda Cherukur	186	187
6. Chintareddipaliem and Rajupaliem	303	315
7. Kodayapaliem	216	153
8. Kanupartipaud	724	614
9. Pottaipalliem	28	...
10. Vavilatipaud	20	...
11. Gundlapaliem	100	100
12. Padarpalli	400	100
Total ...	4,439	5,139

(1) The discrepancy in Nellore and Allipuram villages calls for no explanation.

(2) *Gudipallipaud.*—The wide discrepancy between the figures given by the Tahsildar and those of the Public Works Department is due to the fact that dry lands in Kodurpaud, a hamlet of Gudipallipaud, were left out of account by the Tahsildar.

(3) *Labur.*—An extent of 560 acres was found to be irrigable in this village. This did not find a place in the report of either the Collector or the Tahsildar. These are too high to be commanded by any of the delta channels.

(4) *Peddacherukur and Chintareddipaliem.*—The figures coincide.

(5) *Kondiapaliem.*—The dry fields given in the Tahsildar's statements are too high to be commanded by the tank channels, while the rest of the land can be irrigated. It is advisable to abandon the Musunur tank, about 100 acres, as the ayacut under the tank is being irrigated, partly by the Nellore tank, and partly by the Saravapalli canal.

(6) *Kanapartipaud.*—The greater portion of the land, available for irrigation in the village of Kanapartipaud, lies between the main drain and Golagamudi channel. The lands can be commanded by the delta channel; but the supply is uncertain, as it is only sufficient when the channels are running full—a state of thing that does not continue for any length of time in the Pennéru delta. No new channel from the tank need be dug, as there is an existing spyhon culvert across Saravapalli canal and a channel branching off from a minor channel to Kondiapaliem, joins this with the Nellore tank channel.

(7) *Pottayapaliem.*—No levels were taken for lands in this village, as the extent given by the Tahsildar is only 28 acres. The great discrepancy between the figures given by the Tahsildar in 1892 and now is due to his having included in the former list, lands on the river side of the flood embankment, the cultivation of which is out of question.

(8) *Vavilatipaud.*—There are only 20 acres available for cultivation in this village and this can be irrigated under the delta system.

(9) *Gundlapaliem.*—This is a shrotriem village where, it is believed, there is concealed cultivation to the extent of 100 acres; the Revenue Department is investigating the matter. These 100 acres, therefore, as not being the mamool shrotriem wet, are included in the extra ayacut.

(10) *Padurpalli.*—The extent available for cultivation has been over-estimated by the Tahsildar by 400 acres. There is already a tank branch channel from the Kondiapaliem channel to irrigate these lands. The road culverts and other masonry works are in good order, but the channel has silted up. The area commanded by this channel is only 200 acres; but the total wet as per original shrotriem grant is 95 acres. Thus water-tax can be levied only on 105 acres.

Thus the total area that can be brought under cultivation in case the supply to the tank is improved is 5,139 acres or in round numbers 5,000 acres.

17. The cost of the project is as follows:—

	RS.
2. Lands ...	4,000
3. Works ...	61,800
12. Earthwork ...	1,06,000
15. Miscellaneous ...	360
Total ...	1,72,160
Distributaries ...	37,840 *
Total ...	2,10,000
Establishment charges at 23 per cent. on Rs. 2,03,400, excluding Rs. 6,600 for compensation ...	46,782
Tools and plants ...	2,813
Abatement of land revenue at 25 years' kist ...	6,405
Grand Total ...	2,66,000

18. Establishment and maintenance charges—

	Per month. RS.
One channel Superintendent for head works and channel down to tank ...	25
Three head sluice lascars at Rs. 6 each per mensem ...	18
Six head coolies for 13 miles at Rs. 6 per mensem each ...	36
One tank Superintendent ...	15
Four conservancy lascars for distribution of water at Rs. 6 each ...	24
Total ...	118

Establishment charges for one year ...	1,416
Maintenance of supply channel for one year ...	2,000
Do. of tank for one year ...	584
Do. of distributaries for one year ...	1,500
Unforeseen works for one year ...	500
Total ...	6,000

* This includes compensation for land (Rs. 2,600).

19. Returns— RS.

Enhanced rate of assessment on the present ayacut due to a retransfer from second to first	...	2,067
Remission for theervakammi	...	2,100
Water-tax at Rs. 4 an acre on 5,000 acres	...	20,000
Total	...	24,167
Deduct maintenance charges at Rs. 0–8–0 per acre	...	6,000
Net return	...	18,167

This represents a return of 6·83 per cent. on the capital Rs. 2,66,000.

20. Provision has been made for compensation and demarcation.

21. All hydraulic details are given on the plans.

22. The ryots have already taken up all the land available, and there is, no doubt, no time will be lost by them in bringing the land under cultivation, as the land, though poor as dry land, is very suitable for wet cultivation, and the paddy of Nellore, which has been the granary of Madras since Madras was a town, is noted for its excellence.

23. One note of warning is necessary here. The experience of the last five years has shown that there are years when the Penneru will top the Nellore anicut for a very few days in the year far too few to fill the tank. Unless it be clearly understood that the Nellore tank has not a preferential or even equal claim with the Penner and Sangam deltas, it is likely in times of scarcity that the two delta systems will suffer as the superior push, and the more insistent clamour of the Nellore ryots will ever bear all rules and regulations. They even now claim a preferential right, and are not likely to acquiesce even in Government orders.

It must rest with the Executive officers of the Nellore division to see that the irrigation in the Sangam delta does not suffer in consequence of the proposed head sluice in the right bank. The main point is, from the first to insist on the priority of the claims of the Sangam and Pennér deltas, and frame local rules accordingly.

STATEMENT showing the amount of average rainfall in each of the minor basins of the Pennéru.

Minor basins of the Pennéru.	South-west monsoon.		North-east monsoon.		Remarks.
	Drainage area.	Rainfall in inches.	Drainage area.	Rainfall in inches.	
Upper Pennéru basin	4,732	17·03	..	7·72	
Kundu basin	3,184	21·25	..	6·30	
Chitravati basin	2,280	15·84	..	8·86	
Papaghni basin	2,456	12·51	..	8·77	
Cheyur basin	2,764	14·20	..	11·71	
Sagileru do.	1,248	15·81	..	9·41	
Minor drainage in left bank of Pennéru between Upper Pennéru and Kundu basins ..	64	16·63	..	7·04	
Minor drainage in left bank of Pennéru between Kundu and Sagileru basins ..	256	18·76	..	10·01	
Minor drainage in left bank of Pennéru between Sagileru basin and Sangam anicut	..	12·23	960	21·48	
Minor drainage in left bank of Pennéru between Sangam and Nellore anicuts.	..	9·83	192	26·66	
Minor drainage in left bank of Pennéru between Chitravati and Papaghni basins	448	..	..	..	No rainfall stations.
Minor drainage in left bank of Pennéru between Papaghni and Cheyer basins.	576	16·64	..	11·35	
Minor drainage in left bank of Pennéru between Cheyer and Sangam anicuts.	..	..	384	..	Do.
Minor drainage in right bank of Pennéru between Sangam and Nellore	..	12·38	256	27·86	
Lower Penneru basin between anicut and sea.	..	13·01	448	26·55	
Total ..	18,008	196·12	2,240	183·72	
Average ..	..	13·07	..	12·25	

	SQ. MLS.
Total drainage area of Pennéru	20,248
Area under the influence of south-west monsoon	18,008
Do. do. of north-east monsoon	2,240

STATEMENT showing the discharges of the Nellore Anicut.

—	April.		May.		June.		July.		August.		September.	
1	2		3		4		5		6		7	
1877-78	..	..	7,162	7	7,416	10	..	..	..	..	51,650	26
1878-79	..	..	..	..	5,602	8	29,088	25	40,496	31	60,945	26
1879-80	..	..	25,091	9	15,629	24	6,667	11	43,318	31	26,489	30
1880-81	..	..	..	..	1,798	4	238	1	16,271	11	24,161	22
1881-82	..	..	..	..	596	3	..	..	14,055	11	19,297	28
1882-83	..	..	999	7	..	..	..	..	3,151	3	20,965	26
1883-84	..	..	..	..	3,841	2	2,242	..	25,020	15	2,543	5
1884-85	..	..	..	..	..	..	..	..	789	2	1,370	3
1885-86	..	..	298	3	1,389	3	6,089	6	16,324	8	14,614	14
1886-87	..	..	..	..	..	..	..	..	27,730	14	..	..
1887-88	..	..	..	..	..	..	6,802	6	16,924	12	57,441	29
1888-89	..	..	..	..	..	..	..	..	..	..	..	..
1889-90	..	..	..	..	..	..	8,886	8	12,521	17	54,758	30
1890-91	..	..	..	..	..	..	..	..	6,419	4	14,402	15
1891-92	..	..	..	..	..	..	..	..	1,229	2	..	..
1892-93	..	..	..	..	7,594	6	30,790	24	36,855	22	52,171	30
1893-94	..	..	..	..	..	..	11,455	14	1,823	3	4,863	8
Total ..	..	..	33,550	26	43,865	60	102,257	95	262,925	186	385,669	292
Average ..	..	..	1,973	1·5	2,580	3·5	6,015	5·5	15,466	11	22,687	17

—	October.		November.		December.		January.		February.		March.	
	8		9		10		11		12		13	
1877-78	50,808	31	42,708	28	562	..	..	..	..	..	..	..
1878-79	101,616	31	38,461	30	7,221	17	..	..	..	..	..	..
1879-80	13,171	28	30,474	30	..	..	..	..	..	..	..	..
1880-81	18,610	26	51,896	30	34,663	31	..	..	..	..	..	..
1881-82	20,882	15	22,933	29	1,671	19	4,842	12	..	..	..	..
1882-83	23,266	28	42,361	15	50,532	16	4,240	..	..	..	..	..
1883-84	53,820	26	67,231	30	25,779	28	2,812	.	861	..	..	..
1884-85	35,725	20	83,873	30	42,704	31	10,845	22	..	..	40	1
1885-86	30,749	29	33,994	30	32,619	28	2,287	6	..	..	..	..
1886-87	47,266	19	30,611	28	1,525	5	..	..	..	..	..	..
1887-88	36,086	29	66,309	30	39,489	29	8,074	9	..	..	..	..
1888-89	6,015	9	45,564	26	7,380	13	..	..	..	..	..	..
1889-90	101,473	30	14,770	28	3,811	7	2,871	7	..	..	..	..
1890-91	21,458	17	20,417	15	381	4	..	..	..	..	..	..
1891-92	3,002	5	..	..	..	..	..	..	..	..	..	..
1892-93	77,187	31	32,143	16	667	2	..	..	..	..	1,133	1
1893-94	39,293	29	79,018	30	4,192	11	..	..	..	..	..	..
Total ..	680,427	403	702,793	425	253,196	241	35,971	56	..	..	..	..
Average ..	40,025	23·6	41,341	25	14,894	14	2,116	3·3	..	..	..	..

N.B.—Amount of waste—

	Millions of c. ft.
In May	1,973
June to August	24,061
September to November	104,053
December and January	17,010
Total ..	147,097
Deduct water required for Sangam project from 1877—84 (before Sangam anicut came into operation)	7,741
∴ Net waste	139,356

(2) Average number of days on which water overflowed the anicut at Nellore * from 1884—94 is fifteen days.

* During June, July and August.

NELLORE,
April 1895.

(Signed) C. H. D. MARJORIBANKS,
Executive Engineer.

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks.
1	2	3	4	5	6	7
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.	RS.	RS.	RS.	RS.	
	49. *Irrigation.*					
	Pennéru River System.					
	I Works.					
	2. Main Canals and Branches.					
	Supply Channel from above Sangam anicut to Nellore tank.					
2. Land ..	Compensation for land	4,000	4,000			
3. Regulators ..	Head sluice	23,700	23,700			
4. Falls and weirs.	Drop and tunnel across Tatiparti surplus 5 miles 3 furlongs 330 feet.	11,500				
Do. ..	Drop at 6 miles 4 furlongs	6,000	17,500			
6. Other cross drainage.	Aqueduct at 0 mile 2 furlongs ..	2,250				
Do. ..	Do. at 0 mile 4 furlongs ..	2,300				
Do. ..	Tunnel under Gollakondukur Lodum ..	17,200	21,750			
12. Earthwork ..	Excavation and banking	76,000				
Do. ..	Gollakondukur channel improvements ..	30,400	1,06,400			
15. Miscellaneous.	Demarcation stones	350	350	1,73,700		
	3. Distributaries.					
	Minor channel from Nellore Tank.					
2. Land ..	Compensation for land	310	310			
3. Works ..	Road culvert Nos. 1, 2 and 3 improvements.	900				Lump sums.
Do. ..	Railway culvert	2,000				
Do. ..	Aqueduct across Saravapalli canal ..	3,550				
Do. ..	Regulator	1,360	7,810			
4. Earthwork ..	Banking	1,700	1,700			
	Branch Channel No. 1.					
2. Land ..	Compensation for land	1,200	1,200			
3. Works ..	Road culvert at 1 mile 4 furlongs ..	650				
Do. ..	Do. at 0 mile 4½ furlongs ..	540				
Do. ..	Sluice at 0 mile 7 furlongs, right bank ..	90				
Do. ..	Aqueduct at 7½ furlongs	2,450				
Do. ..	Road culvert at 1 mile	340				
Do. ..	Sluice at 1 mile 2 furlongs, right bank ..	150				
Do. ..	Do. at 1 mile 3 „ left bank ..	150				
Do. ..	Do. at 1 mile 6 „ right bank ..	150				
Do. ..	Drop at 2 miles 2 furlongs	490				
Do. ..	Do. at 3 miles 1¼ furlongs	160				
Do. ..	Do. at 3 miles 4 „	250				
Do. ..	Regulator at 4 miles ½ furlong ..	120				
Do. ..	Sluice at 4 miles 1½ furlongs, right bank..	150				
Do. ..	Do. at do. left bank ..	150				
Do. ..	Do. at 4 miles 4 furlongs, right bank ..	150				
Do. ..	Drop at 4 miles 4 furlongs	120	6,110			
4. Earthwork ..	Excavation and banking	4,870	4,870			
5. Miscellaneous.	Demarcation stones	320	320	12,500		
	Minor Branch Channel A, from 1 mile 5½ furlongs of Branch Channel No. 1.					
2. Land ..	Compensation for land	360	360			
3. Works ..	Sluice at head, right bank	220				
Do. ..	Culvert across Mypaud road	330				
Do. ..	Sluice at 1½ furlongs, right bank ..	150				

Estimate Form—Abstract—Classified—cont.

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks.
1	2	3	4	5	6	7
	Minor Branch Channel A, from 1 mile 5½ furlongs of Branch Channel No. 1—*cont.*	RS.	RS.	RS.	RS.	
3. Works ..	Sluice at 1 mile, right bank	150				
Do. ..	Do. at 1 mile 2½ furlongs, left bank ..	170				
Do. ..	Aqueduct across Jaffer Saib's canal ..	3,140				
Do. ..	Sluice at 1 mile 6½ furlongs, left bank ..	140				
Do. ..	Drop at 1 mile 6½ furlongs	180				
Do. ..	Sluice at 2 miles 2 furlongs	170				
Do. ..	Aqueduct across Gudipallipaud channel, 2 miles.	680				
Do. ..	Sluice at 2 miles 4 furlongs, left bank ..	160				
Do. ..	Regulator at 2 miles 5½ furlongs ..	130				
Do. ..	Sluice at 2 miles 6½ furlongs	160				Similar estimate for sluice at 2 miles 4 furlongs.
Do. ..	Regulator 2 miles 7½ furlongs	160				
Do. ..	Road culvert at 3 miles 3¾ furlongs ..	140	6,080			
4. Earthwork ..	Excavating and banking	2,400	2,400			
5. Miscellaneous.	Demarcation stones	120	120			
	Sub-Branch Channel C.			8,960		
2. Land ..	Compensation for land	110	110			
4. Earthwork ..	Excavation and banking	200	200			
5. Miscellaneous.	Demarcation stones	30	30			
	Sub-Branch Channel D.			340		
2. Land ..	Compensation for land	140	140			
4. Earthwork ..	Excavation and banking	420	420			
5. Miscellaneous.	Demarcation stones	60	60			
	Minor Branch Channel B, from 4 miles ½ furlong of Branch Channel No. 1.			620		
2. Land ..	Compensation for land	150	150			
3. Works ..	Sluice at 2 furlongs, right bank ..	160				
Do. ..	Do. at 6 furlongs, right bank ..	150				
Do. ..	Aqueduct at 1 mile	910				
Do. ..	Drop and vent at 1 mile ¾ furlong ..	150	1,370			
4. Earthwork ..	Excavation and banking	1,320	1,320			
5. Miscellaneous.	Demarcation stones	110	110			
	Branch Channel No. 2.			2,950		
2. Land ..	Compensation for land	240	240			
3. Works ..	Sluice at 3½ furlongs, right bank ..	150				
Do. ..	Do. at 3½ furlongs, left bank.. .	150				
Do. ..	Drop at 4 furlongs	160				
Do. ..	Sluice at 1 mile 2½ furlongs	150				
Do. ..	Drop at 1 mile 2½ furlongs	60				
Do. ..	Aqueduct at 1 mile 4 furlongs 300 feet ..	580				
Do. ..	Do. at 1 mile 5½ furlongs ..	550				
Do. ..	Regulator at 1 mile 6 furlongs	110	1,910			
4. Earthwork ..	Excavation and banking	220	220			
5. Miscellaneous.	Demarcation stones	110	110			
	Branch Channel No. 3.			2,480		
2. Land ..	Compensation for land	80	80			
3. Works ..	Aqueduct at 1,200 feet	530	530			
4. Earthwork ..	Excavation and banking	100	100			

Estimate Form—Abstract—Classified—cont.

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks.
1	2	3	4	5	6	7
	Branch Channel No. 3—*cont.*	RS.	RS.	RS.	RS.	
5. Miscellaneous.	Demarcation stones	20	20	730	2,12,100	
	Establishment at 23 per cent. on Rs. 2,05,510, exclusive of land ..				47,268	
	Tools and plant ..				2,632	
	Total ..				2,62,000	

No. 191 I.

Note by the Chief Engineer for Irrigation.

The plans and estimates for a supply channel to Nellore tank from above the Sangam anicut are submitted to Government with a recommendation that they may be sanctioned.

	RS.
Capitalized abatement of land revenue at 3½ per cent.	5,605
Leave and pension allowances ...	6,617
Total ...	12,222

2. The estimate for the channel, including distributaries and establishment and tools and plant charges, amounts to Rs. 2,62,000, or 2,74,222 including indirect charges as noted in the margin.

3. The revenue is estimated at Rs. 23,000 as noted below :—

		RS.
5,000 * acres at Rs. 4 per acre		20,000
Enhanced rate of assessment on the present irrigation due to a retransfer † from 2nd to 1st class		2,067
Saving of remission		2,100
	Total ...	24,167
Deduct collection charges at 5 per cent.		1,208
	Net total ...	22,959
	(or say Rs. 23,000)	

* *Vide* letter No. 1299, dated 5th June 1895, from the Collector of Nellore.
† *Vide* letter No. 381, dated 13th February 1894, from the Collector of Nellore.

4. The cost of maintenance and repairs is estimated at RS. 4,584

	RS.	
Establishment charges at 23 per cent. as expenditure ...	1,064	
Do. at 6 per cent. on revenue	1,450	
		2,514
Tools and plant, say		52
	Total ...	7,150
Indirect charges and leave and pension allowances		350
	Total ...	7,500

5. The net revenue will be Rs. 15,500 or 5·916 per cent. on the estimated capital for direct charges, or 5·65 per cent. on the estimated capital outlay including indirect charges.

6. The proposed work is therefore remunerative and is recommended for sanction under open capital account, the sanction to remain current until 31st March 1899.

7. The Nellore tank is at present a component part of the Pennéru (Nellore) anicut system and some 3,500 acres are partly irrigated by the anicut channels and partly from the tank which, as explained in the report accompanying the estimate, at present obtains a precarious supply direct from the river. If the proposals now made are approved and the tank is given a supply by a channel from above the Sangam anicut, it will become a component part of that system and the irrigation under the two systems becomes still further blended. The Chief Engineer for Irrigation would point out that the Sangam and Pennéru (Nellore) anicut systems and the Nellore tank all derive a supply from the same source and that there is no advantage in maintaining separate accounts for these systems which are close together on either bank of the Pennéru river. It is suggested therefore that, with the approval of the Government of India, the Pennéru and Sangam systems and the Nellore tank may in future form one system which may be called the "Pennéru river system."

8. In the concluding paragraph of the report which accompanies the estimate, the Executive Engineer brings to notice the necessity of ruling that the connection of Nellore tank with the Sangam anicut confers no right to water when the delta irrigation is not fully supplied. The Nellore tank at present receives a supply through its existing channel when 2 feet of water pass over the Nellore anicut, and the only change proposed to be made is to give it a supply when water is level with the crest of that anicut. This concession is a considerable boon to the ryots holding lands under the tank, but confers no right of any description. In times of scarcity the irrigation under the two anicuts must receive a supply before water is let into the Nellore tank.

MADRAS, (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
14th October 1895. Chief Engineer for Irrigation.

ORDER—No. 948 I., dated 11th November 1895.

The estimates amounting to Rs. 2,62,000 for direct charges, or Rs. 2,74,222 including indirect charges, for a supply channel from the Pennéru river above the Sangam anicut to the Nellore tank and for improving the distributaries from the tank are approved and will be submitted for the sanction of the Government of India under Open Capital Account.

2. Ordered that the following letter be sent to the Government of India.

[Here enter No. 949 I., dated 11th November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, II Circle.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 11th.

Recd. *Encl.*

G.O. No. 948 I., 11th Nov. 1895.

NOVEMBER.

Channel

Estimates amounting to Rs. 2,74,222 for a supply — from the Pennéru river above the Sangam anicut to the Nellore tank and for improving the distributaries from the tank, approved and ordered to be submitted for the sanction of the Government of India.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

LETTER—from

Colonel R. R. E. DRAKE-BROCKMAN, R.E.,
Joint Secretary to the Government of Madras,
Public Works Department,
Irrigation Branch,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

SIR,

In forwarding, herewith, a copy of Proceedings of the Madras Government, No. 948 I., dated 11th November 1895, I am directed to request that the Government of India will be pleased to accord sanction under Open Capital Account to the estimates amounting to Rs. 2,62,000 for direct charges, or Rs. 2,74,222 including indirect charges, for a supply channel from the Pennér river above the Sangam anicut to the Nellore tank and for improving its distributaries. The return anticipated is estimated at 5·652 on the proposed outlay, and the work will not only be remunerative in ordinary years but also a sure protection against scarcity.

2. I am further to request permission to include in one account the receipts and expenditure of both the Sangam and Pennér (Nellore) anicut systems, which latter includes the Nellore tank which it is now proposed to connect with the Sangam system. These anicut systems have the same source of supply and may be treated as one system to be called "the Pennér river system." This amalgamation of the irrigation under the Pennér river will simplify accounts without any disadvantage.

I have the honour to be,
Sir,
Your most obedient servant,

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

MADRAS,
11th November 1895.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 11th.

Recd. *Encl.*

No. 949 I., 11th November 1895.

NOVEMBER.

Channel

Requesting sanction to the estimates, amounting to Rs. 2,74,222, for a supply — from the Pennér river above the Sangam anicut to the Nellore tank and for improving its distributaries, and to the inclusion in one account under "the Pennér river system" the receipts and expenditure of both the Sangam and Pennér (Nellore) anicut systems.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From the Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated 31st July 1895, No. 987.

In continuation of paragraph 4 of this office No. 3191, dated 23rd March 1895, I have the honour to forward for sanction, against the capital account of the canal, an estimate amounting to Rs. 12,500 for improving the North canal from 65 miles 3 furlongs to 75 miles 2 furlongs.

2. The necessity for the work has been explained in the report accompanying the estimate.

3. The work will be included for execution in the programme of capital works. for 1896–97.

ENCLOSURE.

REPORT to accompany the estimate for improvements to North canal 65/3 to 75/2 miles.

This estimate has been included in the canal completion estimate, and is supplementary to the locks at Pambli and Swarnamukhi north flood gate, sanctioned in G.O. No. 489 I., dated 15th June 1895. A reference to the letters printed with that Government Order will show the necessity for the improvements to canal, miles 65/3 to 75/2. Formerly, this reach had no bar that remained open for more than a few weeks in the north-east monsoon when tides range high, and its water level thus always remained above M.S.L.; but two years back, owing to interference with the Kondur bar by the neighbouring villagers, that bar has lately developed towards the south end of the back-water and has scoured out such deep channels in the direction of the Dugarazapatam river that it now opens when the floods are comparatively low, and keeps open up to June, so that this reach is now tidal for nine months in the year, and owing to the silted-up state of the bed, it is impossible to keep open navigation during the low tide season.

2. This estimate provides, therefore, for deepening the reach throughout to 3 feet below L.R.T., with a sole of 20 feet and 4 to 1 slopes. If these improvements are made, the canal can be maintained to this section in future at a small annual outlay.

3. The spoil taken from the deepening will be utilized, wherever necessary, in repairing water slopes, filling in gullies, and re-sectioning old banks.

MADRAS,
31st July 1895.

(Signed) A. S. RUSSELL,
Executive Engineer, Buckingham Canal.

No. 231 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining the sanction of Government to the estimate, amounting to Rs. 12,700, for improving the North canal from miles 65/3 to 75/2 of Buckingham Canal.

2nd October 1895.

(Signed) A. S. RUSSELL,
Offg. Suptg. Engineer, II Circle.

No. 205 I.

Submitted to Government with a recommendation that the estimate forwarded by the Superintending Engineer, II Circle, be sanctioned.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

6th November 1895.

ORDER—No. 956 I., dated 12th November 1895.

The following estimate is sanctioned in lieu of the lump sum of Rs. 10,000 provided for the work in the completion estimate, printed in Proceedings of Madras Government No. 623 I., dated 8th August 1895, the excess of Rs. 2,700 being met from the balance of the amount available for unforeseen works of the Buckingham Canal, which will then be reduced to Rs. 2,18,927 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Buckingham Canal.
Capital Account.
I. Works.
2. Main Canals and Branches.
Northern Canal.
12. Earthwork.
Improvements to Canal from 65/3 to 75/2 miles.

	RS.
Estimate	12,700

2. This sanction is registered as No. 132 I. of 1895-96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle, with four enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 12th.

Recd. *Encl.*

G.O. No. 956 I., 12th Nov. 1895.

NOVEMBER.

Buckingham Canal

Estimate of Rs. 12,700 for improvements to the — from 65/3 to 75/2 miles, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From the Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 3rd October 1895, No. 368 S.E.

I have the honour to forward, herewith, the annual floating plant statement of Kistna project showing the estimated requirements for its upkeep in 1896–97.

2. This estimate shows that Rs. 25,580 are required for annual repairs and Rs. 9,300 for special repairs.

3. With regard to the latter, a departure has been made in providing lump sums for unforeseen works which are yearly required, although the individual boats which will require such works cannot be known until the boats are returned for annual repairs. Where it is known that extensive special repairs are required to any boat, a grant for that boat has, as heretofore, been applied for.

4. The composite punts are all of them found too weak for the heavy work they are required to do, and the strengthening of these punts has been in progress during the last two years. Nos. 44, 45, 47, 48 and 65 have already been strengthened and funds are applied for for strengthening five more next year. The punts which most urgently require strengthening will be selected when the boats are sent in for repairs.

5. The sums now asked for are reduced to the lowest possible amount, and it is hoped that an allotment to the full amount of the estimate may be given. It is undoubtedly extravagant to allow boats requiring repairs to work, yet this is what must be done if the necessary funds are not provided to allow of annual and special repairs being undertaken as soon as the necessity for them arises.

6. During the current year, the dredge No. 3 Ajax, punt No. 77, have been broken up and the useful material brought on stock. They have therefore been omitted in the list for 1896–97.

7. There are *minus* book values on iron punts Nos. 9 and 28, and small work values of less than Rs. 100 on iron punts Nos. 4, 8, 14, 19, 29 and 37, composite punts Nos. 46, 48, 49 and 54 and staff boat No. 12. I propose to send a revaluation statement for these for sanction of Government as early as possible.

ENCLOSURES.

STATEMENT of irrigation floating plant in the Kistna district showing the estimated cost of upkeep during the year 1896–97.

Part I.—Steamers and Steam-dredges.

Registered number.	Details of plant.	Value of plant. Original value.	Value of plant. Present book value.	Probable cost of upkeep for 1896–97.	Remarks.
		RS.	RS.	RS.	
1	Steamer "Alexandria"	13,131	3,589	1,510	The machinery is in fair working order. The hull is much worn and many fresh plates will probably be required next year.
..	Special repairs	..	..	1,000	
	Total ..	13,131	3,589	2,510	
* 1	Dredge steam	15,614	4,183	480	In fair working order.
* 2	Do.	15,614	4,183	480	
* 5	Do.	30,439	8,331	670	
1	Cockburn's dredge	5,034	3,258	300	
..	Value of iron punt No. 19 ..	2,299	1,436	245	
	Total, Dredges ..	69,000	21,391	2,175	
..	Maintenance	..	..	2,175	

* For present book value of revaluation of dredges Nos. 1, 2 and 5—See G.O., No. 550 I. of 8th July 1895.

Part II.—Boats and Plants.

Registered number.	Description of boats.	Value of plant. Original value.	Value of plant. Present book value.	Probable cost of upkeep for 1896–97.	Remarks.
		RS.	RS.	RS.	
1	Iron punt	2,812	145	245	Under repairs.
2	Do.	2,811	281	245	Requires extensive repairs.
..	Special repairs	..	..	500	
3	Iron punt	2,812	670	245	Under repairs.
4	Do.	2,812	75	245	In working order.
..	Special repairs	..	30		
5	Iron punt	2,812	319	245	
6	Scoring dam	..	..	245	
7	Iron punt	2,812	439	245	
8	Do.	2,812	81	245	
9	Do.	2,812	—81	245	
10	Do.	2,812	167	245	
11	Do.	2,811	297	245	
12	Do.	2,811	547	245	
13	Do.	2,811	1,811	245	Requires extensive repairs.
..	Special repairs	..	..	500	
14	Iron punt	2,811	80	245	In working order.
15	Do.	2,811	155	245	
16	Do.	3,610	2,610	170	
18	Do.	2,186	1,186	245	
..	Special repairs	..	70		
19	Iron punt	2,185	54	245	
..	Special repairs	..	..	..	
20	Iron punt	2,172	852	245	
..	Special repairs	..	20		
21	Iron punt	2,172	690	245	
..	Special repairs	..	600	500	Requires extensive repairs.
22	Iron punt	2,172	1,172	245	In working order.
23	Do.	3,951	1,475	245	Under repairs.
24	Do.	2,172	428	245	In working order.
25	Do.	4,091	845	245	
26	Do.	2,299	296	245	
27	Do.	5,916	2,151	245	
28	Do.	1,584	— 60	190	
29	Do.	1,524	39	190	
30	Do.	1,524	36	190	
..	Special repairs	..	400		
31	Iron punt	2,181	435	190	In working order.
32	Do.	1,960	280	190	Under repairs.

Part II.—Boats and Plants—*cont.*

Registered number.	Description of boats.	Value of plant. Original value.	Value of plant. Present book value.	Probable cost of upkeep for 1896-97.	Remarks.
		RS.	RS.	RS.	
33	Iron punt	1,960	604	190	
34	Do.	1,960	280	190	
35	Do.	400	141	190	
36	Do.	400	279	190	
37	Do.	250	80	190	
38	Do.	1,400	123	190	In working order.
41	Do	4,063	1,462	265	
42	Do.	4,171	1,485	265	
43	Do.	4,242	1,608	265	
..	Special repairs to iron punts lump sum	..	..	1,000	
	Total, Iron punts	99,907	24,657	11,680	
..	Maintenance	..	..	9,180	
..	Special repairs	..	..	2,500	
	Total	..	..	11,680	
17	Circular trap punt	1,200	1,462	170	It is proposed to convert this into an ordinary punt. It is useless in its present form.
..	Special repairs	..	..	2,000	
	Total	..	..	2,170	
39	Iron punt, small	250	114	50	It is proposed to put a deck to this punt so that it may be used for conveying material.
..	Special repairs	..	..	200	
	Toal	..	..	250	
40	Trap punt, iron	3,652	2,187	220	In good order.
..	Anicut paddle boat, "violet"	900	150	150	This boat is old and weak, and requires extensive repairs.
..	Special repairs	..	..	200	
	Total	..	..	350	
	Anicut pinnace	224	181	55	
44	Composite punt	2,500	1,200	300	In good order; has been strengthened this year.
45	Do.	2,500	1,200	300	
46	Do.	2,500	53	300	In working order, but weak; must be strengthened.
..	Special repairs	..	..	..	
47	Composite punt	2,288	182	300	In good order; has been strengthened last year.
..	Special repairs	..	200	..	
48	Composite punt	2,287	91	300	In good order; has been strengthened this year.
49	Do.	2,287	— 148	300	
..	Special repairs	..	200		
50	Composite punt	2,160	179	300	
..	Special repairs	..	300	..	
51	Composite punt	2,160	697	300	
..	Special repairs	..	..	..	
52	Composite punt	2,160	193	300	These boats are in working order, but weak; must be strengthened.
..	Special repairs	..	100	..	
53	Composite punt	2,160	156	300	
..	Special repairs	..	..	..	
54	Composite punt	2,055	14	300	
55	Do.	1,900	521	300	
56	Do.	2,013	719	300	
57	Do.	2,075	453	300	In good order; has been strengthened last year.
..	Special repairs	..	200	..	
58	Composite punt	2,085	726	300	These boats are in working order.
59	Do.	2,156	318	300	
60	Do.	2,064	230	300	In good order; has been strengthened last year.
..	Special repairs	..	200	..	
61	Composite punt	2,168	372	300	These boats are in working order, but are weak; must be strengthened.
62	Do.	2,169	275	300	
..	Special repairs	..	100	..	
63	Composite punt	2,164	398	300	
64	Do.	2,266	468	300	
65	Do.	2,238	355	300	Ingood order; has been strengthened this year.
66	Do.	3,000	1,600	330	In working order, but weak; must be strengthened.
..	Special repairs	..	100	..	
67	Composite punt	3,000	1,600	330	In good order; have been strengthened last year.
..	Special repairs	..	300	..	
68	Composite punt	3,000	499	330	
..	Special repairs	..	250	..	

Part. II.—Boats and Plants—*cont.*

Registered number.	Description of boats.	Value of plant. Original value.	Value of plant. Present book value.	Probable cost of upkeep for 1896–97.	Remarks.
		RS.	RS.	RS.	
69	Composite punt	2,600	467	330	These boats are in working order, but weak; must be strengthened.
70	Do.	2,600	1,280	330	
71	Do.	2,600	128	330	
72	Do.	2,600	128	330	
..	Special repairs	..	100	..	
73	Composite punt	2,600	320	330	In good order; has been strengthened.
..	Special repairs	..	200	..	
74	Composite punt	2,600	484	330	These boats are in working order, but weak; must be strengthened.
75	Do.	3,811	1,105	330	
76	Do.	2,553	521	330	
	Total ..	79,319	19,034	10,230	
1	Maintenance	..	..	10,230	For present book value of revaluation of iron punts Nos. 13, 16, 18 and 22, Composite punts Nos. 44, 45, 66, 67 and 70. Please see G.O., No. 550 I. of 8th July 1895.
..	Special repairs, strengthening five composite punts	..	..	2,000	
..	Unforeseen special repairs	..	..	1,000	
	Total ..	..	..	13,230	
11	Staff boat	1,621	127	190	All these boats are in working order.
..	Special repairs	..	150	..	
12	Staff boat	1,621	31	190	
14	Do.	1,355	..	160	
..	Special repairs	..	170	..	
15	Staff boat	* 1,963	548	190	
..	Special repairs	..	330	250	
16	Staff boat	1,556	434	160	
17	Do.	990	262	160	
..	Special repairs	..	100	..	
18	Staff boat	2,486	1,947	190	
19	Do.	1,815	1,664	160	
20	Do.	2,271	2,082	190	
21	Do.	1,721	1,578	160	
..	Superintending Engineer's Camp Clerk's boat	359	365	90	
..	Special repairs	..	100	..	
	Total ..	17,758	9,888	2,090	
..	Unforeseen special repairs	..	..	150	
	Grand Total ..	..	..	2,240	

Abstract.

	RS.
Maintenance ..	1,840
Total special repairs ..	400
Total ..	2,240

* In G.O., No. 977 I. of 8th December 1894, passing orders on return of staff boats for 1893–94, the original value of the boat was estimated as Rs. 1,898.

Abstract showing the comparison of details between the estimated maintenance cost of floating plant in Kistna district for 1894–95, 1895–96 and 1896–97.

—	Numbers. 1896–97.	Numbers. 1895–96.	Original values. 1896–97.	Original values. 1895–96.	Present book values. 1896–97.	Present book values. 1895–96.	Cost of upkeep. 1896–97.	Cost of upkeep. 1895–96.
			RS.	RS.	RS.	RS.	RS.	RS.
Steamers	1	1	13,131	13,131	3,589	4,902	2,510	4,510
Dredges	4	5	69,000	97,357	21,391	—26,466	2,175	3,675
Iron punts	40	41	99,907	1,00,746	24,657	25,600	11,680	11,180
Composite punts	33	33	79,319	79,319	19,034	14,088	13,230	16,630
Iron punt, small	1	1	250	250	114	139	250	50
Trap punt	1	1	3,652	3,652	2,187	2,552	220	220
Circular trap punt	1	1	1,200	1,200	1,462	1,582	2,170	170
Anicut paddle boat (violet) ..	1	1	900	900	150	— 80	350	150
Anicut pinnace	1	1	224	224	181	203	55	55
Staff boats	11	11	17,758	17,758	9,888	10,517	2,240	1,840
Total ..	94	96	2,85,341	3,14,537	82,653	33,037	34,880	38,480
Maintenance	..	..	..	..	..	..	25,580	..
Special repairs	..	..	..	..	..	..	9,300	..
Total ..	..	..	..	..	..	..	34,880	..

Detailed approximate estimate of the annual cost of maintenance of irrigation floating plant in Kistna district during 1896–97.

—	Steamer "Alexandria."	Dredges Nos. 1 and 2 at Rs. 480 each.	Dredge No. 5 at Rs. 670 each.	Cockburn's dredges.	Iron punts Nos. 1 to 15 and 18 to 27 at Rs. 245.	Iron punt No. 16.	Iron punt No. 17, circular trap punt.	Iron punt No. 28 to 38 at Rs. 190 each.	Iron punt No. 39, small.
1	2	3	4	5	6	7	8	9	10
Docking and launching	30	16	16	16	15	8	15	15	8
Painting	84	42	70	32	32	23	49	28	14
Caulking	28	22	90	33	38	25	20	22	..
Jarring	..	33	25	16	16	11	21	10	6
Staker	36	..	..	..	..	..	..	..	..
Sarang	75	53	53	..	..	..	..	..	..
Lascars	107	80	90	64	4	4	8	4	4
Ropes	15	8	8	8	5	5	5	5	4
Sundry repairs	200	132	189	68	94	65	23	73	5
Miscellaneous	50	14	14	13	..	..	..	..	..
Centage and contingencies	135	80	115	50	41	29	29	33	9
Expenses for use by departmental officers	750	..	..	..	..	..	..	..	..
Total	1,510	480	670	300	245	170	170	190	50

—	Trap punt No. 40.	Iron punts Nos. 41 to 43 at Rs. 265 each.	Composite punts Nos. 44 to 65 at Rs. 300 each.	Composite punts Nos. 66 to 76 at Rs. 330 each.	Ajax No. 77.	Anicut paddle boat.	Anicut pinnace.	Superintending Engineer's camp clerk's boat.	Staff boats Nos. 11, 12, 15, 18 and 20 at Rs. 190 each.	Staff boats Nos. 14, 16, 17, 19 and 21 at Rs. 160 each.
	11	12	13	14	15	16	17	18	19	20
Docking and launching	15	15	24	24	..	6	5	4	15	10
Painting	47	45	..	..	..	33	9	..	..	..
Caulking	25	40	99	107	28	28	14	21	66	55
Jarring	20	21	..	..	..	3	3	6	10	8
Staker	..	..	..	..	..	..	..	..	..	..
Sarang	..	..	..	..	..	..	..	..	..	..
Lascars	24	4	8	8	96	4	..	8	21	21
Ropes	5	5	5	5	10	5	2	6	12	10
Sundry repairs	46	90	110	129	18	44	12	28	32	30
Miscellaneous	..	..	..	..	..	..	..	..	..	..
Centage and contingencies	38	45	54	57	33	27	10	17	34	26
Expenses for use by departmental officers	..	..	..	..	..	..	..	..	..	..
Total	220	265	300	330	185	150	55	90	190	160

(Signed) W. M. ELLIS, Captain, R.E.,
Executing Engineer.

No. 1532 K.S.

Forwarded to the Chief Engineer for Irrigation.

2. A statement of revaluation, for items on which there have been *minus* values, will be sent as soon as it is received from the Executive Engineer.

(Signed) A. S. RUSSELL,
Offg. Suptg. Engineer, II Circle.

18th October 1895.

ORDER—No. 957 I., dated 12th November 1895.

The estimate of the cost of maintaining the floating plant of the Kistna Delta system is approved; Rs. 34,880 will be provided on this account in the budget estimates for "Major works" for 1896–97.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 12th.

Recd. *Encl.*

G.O. No. 957 I., 12th Nov. 1895.

NOVEMBER.

Floating Plant of the Kistna Delta System

The estimate of the cost of maintaining the —, approved and Rs. 34,880 ordered to be provided on this account in the budget estimates for 1896-97.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From J. HANNAN, Esq., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated 10th October 1895, No. 223 I.

I have the honour to submit herewith an estimate, together with a plan, amounting to Rs. 480, for constructing an auxiliary sluice to Thadapalli side channel at 20th mile 3⅓ furlong of Thadapalli main channel, and request you will be good enough to obtain sanction of Government, as supplemental to the estimates sanctioned in G.O. No. 712 I., dated 5th September 1895.

ENCLOSURE.

REPORT to accompany estimate for an auxiliary sluice to Thadapalli side channel at 20th mile 3⅓ furlong of Thadapalli channel.

It has been found impossible in practice to give sufficient water to the lands under the last two miles of the new Thadapalli side channel when water is low in the main channel. It is therefore proposed, to prevent complaints and litigation, to put an auxiliary sluice in the bank of the main channel at 20 mile 3⅓ furlong, *i.e.*, at 2 miles 1 furlong from head of side channel, through which the supply in the channel may be supplemented when necessary. It is not intended that this sluice shall be always opened, but only when water is insufficient in the side channel.

2. As from the nature of the case, water in the main channel will be low when the sluice has to be opened, there will be practically no head; so a vent is provided large enough to irrigate 451·70 acres, the required area, with a velocity of 1½ feet per second.

(Signed) W. B. DEWINTON,
Ex. Engr., Coimbatore Division.

ORDER—No. 960 I., dated 12th November 1895.

The following supplemental estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Thadapalli Channel System.
Open Capital Account.
I. Works.
3. Distributaries.
Thadapalli Side Channel.
3. Works.
Constructing an auxiliary sluice at 20th mile 3⅓ furlong of main channel.

	RS.
Estimate	480
II. Establishment	110
Total ...	590

2. This sanction is registered as No. 133 I. of 1895–96, and will expire on 31st March 1897.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, IV Circle,
with plan and estimate.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 12th.

Recd. *Encl.*

G.O. No. 960 I., 12th Nov. 1895.

NOVEMBER.

Sluice

Estimate of Rs. 590 for constructing an auxiliary sluice to Thadapalli side channel at 20 miles $3\frac{1}{3}$ furlongs of main channel, Coimbatore division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 23rd October 1895, No. 731 G.N.

I have the honour to submit herewith, for sanction, plans and estimates, amounting to Rs. 3,920, received from the Executive Engineer, Rushikulya Division, for works connected with parallel channel from 5½ miles of Mahanadi canal as per enclosed classified abstract.

2. It will be seen from the accompanying report that the channel is designed to carry supply for 1,164 or, say, 1,200 acres.

3. Out of the estimate amount of Rs. 3,920, Rs. 530 will be met from the lump sum of Rs. 3,000 for irrigation sluices, Rs. 2,650 from the lump sum of Rs. 9,500 for irrigation channels, and Rs. 740 from the lump sum of Rs. 2,000 for Minor works (*vide* items 270, 271 and 272, respectively, of the comparative statement printed with G.O. No. 13 I., dated 10th January 1894).

ENCLOSURES.

REPORT to accompany estimate for parallel channel from 5½ miles, Mahanadi canal.

The channel takes off at 5½ miles of the Mahanadi canal, and extends to 8½ miles.

2. It will irrigate 1,164 or, say, 1,200 acres between the Mahanadi canal and the Gogai nala.

3. The general arrangements are indicated on the longitudinal section.

4. The channel crosses the nalas which pass under the main canal through under-tunnels 11, 12, 13. It is proposed to effect this by means of Raneegunge earthenware pipes. This plan was adopted on No. 1 distributary, Rushikulya canal, and is the simplest and most economical.

5. Taking the acreage as 1,200 :

	RS.
The cost of construction per mile—	
For earthwork ...	833·3
" masonry ...	473·3
Cost per acre irrigated—	
For earthwork ...	2·08
" masonry ...	1·18

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	FAMINE RELIEF AND INSURANCE.	RS.	RS.	RS.	
	35. *Construction of P. I. Works.* Rushikulya Project. Rushikulya Division. I. Works. Mahanadi Canal. 3. Distributaries. Parallel Channel from 5½ miles of Mahanadi Canal.				
1. Preliminary expenses.	1. Preliminary expenses	50	50		
3. Works ..	2. Sluice	530			
	3. Piping arrangement over No. 11 under-tunnel, Mahanadi canal	400			
	4. Piping arrangement over No. 12 under-tunnel, Mahanadi canal	180			
	5. Piping arrangement over No. 13 under-tunnel, Mahanadi canal	160	1,270		
4. Earth work.	6. Excavation of channel	2,500	2,500		
5. Miscellaneous.	7. Fixing demarcation stones	100	100		
	Total estimate ..			3,920	

REMARKS.—Items 1, 6 and 7 are to be met from the lump sum provision of Rs. 9,500 made in G.O. No. 13 I., dated 10th January 1894, for irrigation channels (*vide* item 271 of the comparative statement). Item 2 is to be met from item 270 of the comparative statement. Items 3 to 5 are to be met from item 272 of the comparative statement.

RUSHIKULYA,
9th September 1895.

(Signed) W. C. DEMORGAN,
Executive Engineer, Rushikulya Divn.

ORDER—No. 961 I., dated 12th November 1895.

The estimates aggregating Rs. 3,920 for a parallel channel from 5½ miles, Mahanadi canal, Rushikulya project, are sanctioned, the outlay proposed on item 2 of the classified abstract estimate, on items 1, 6 and 7 and on items 3 to 5 being met from the provision made for items 270, 271 and 272, respectively, of the comparative statement printed in Proceedings of Madras Government No. 13 I., dated 10th January 1894.

2. This sanction is registered as No. 131 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle, with fifteen enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 12th.

Recd. *Encl.*

G.O. No. 961 I., 12th Nov. 1895.

NOVEMBER.

Channel

Estimates aggregating Rs. 3,920 for a parallel — from $5\frac{1}{2}$ miles, Mahanadi canal, Rushikulya project, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, the 31st October 1895, No. 1728 G.D.

I have the honour to state that the Executive Engineer, Gódávari Eastern Division, has incurred an excess outlay of Rs. 514 on excavating side channel from sluice left bank, 35½ miles, Bank canal, and to request that you will be so good as to obtain sanction of Government authorizing the Examiner of Public Works Accounts to admit the excess which the Executive Engineer explains was due to the adjustment of land compensation charges not anticipated.

2. The completion statement in which this work was included and verified by the Examiner of Public Works Accounts is herein enclosed.

ORDER—No. 969 I., dated 15th November 1895.

The Examiner of Public Works Accounts is authorized to admit the excess expenditure incurred on the work referred to.

2. This sanction is registered as No. 134 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle, with three enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O. No. 969 I., 15th Nov. 1895.

NOVEMBER.

Excess Outlay

The Examiner authorized to admit the — of Rs. 514 incurred on excavating side channel from sluice left bank, $35\frac{1}{2}$ miles, Bank canal, Gódávari Eastern division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From the Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 16th October 1895, No. 395 S.E.

I have the honour to forward herewith an estimate for purchasing two Cockburn's dredgers for Kistna delta, and to request that you will be good enough to obtain the sanction of Government for the same in order that the item may be removed from the objectionable item statement under "want of estimate."

2. A separate estimate for mounting the dredgers on punts will be submitted for sanction as soon as the dredgers arrive.

No. 1601 K.S.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining the sanction of Government to the estimate, amounting to Rs. 18,500, for purchasing two Cockburn's dredgers.

30th October 1895.

(Signed) A. S. RUSSELL,
Offg. Suptg. Engineer, II Circle.

Order—No. 970 I., dated 15th November 1895.

The following estimate is sanctioned :—

Irrigation.
42. Major Works (Working expenses).
Kistna Delta System.
Kistna Northern Division.
5. Tools and Plant.
4. Navigation Plant.

	RS.
Purchasing two Cockburn's dredgers referred to in G.O. No. 478 I., dated 22nd June 1894, estimate	18,500

2. This sanction is registered as No. 135 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle, with estimate.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O. No. 970 I., 15th Nov. 1895.

NOVEMBER.

Dredgers

Estimate of Rs. 18,500 for purchasing two Cockburn's — for use in Kistna Northern division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

From A. S. RUSSELL, Esq., Officiating Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated 16th October 1895, No. 15 C.

As time was passing away, and as I could obtain no definite information when the estimate for the Cooum Improvement Scheme will be submitted to me, and is likely to be sanctioned, I requested Mr. Smyth some weeks ago to surrender from the grant of two lakhs for the work such sums as he could not see his way to spend within this official year. Subsequently a reminder was sent to him, and finally on 4th instant I instructed him in detail in a demi-official letter how to dispose of the matter expeditiously. His letter No. 232, dated 9th instant, copy of which is herewith forwarded, makes a complete disposal of the question of what funds should be surrendered from the grant of two lakhs for the Cooum Improvement Scheme.

2. This grant is made up as follows:—

	RS.
Land	1,00,000
Earthwork	50,488
Masonry	30,000
For works ...	1,80,488
Establishment	18,512
Tools and plant	1,000
Total ...	2,00,000

3. Of this amount, Mr. Smyth surrenders Rs. 55,000. This surrender can be utilized as follows:—

	RS.
Balance required for dredger for Buckingham Canal—*vide* this office endorsement No. 207 B.C., dated 17th September 1895 ...	21,000
Capital expenditure on seven locks and flood gates on Buckingham Canal as shown in accompanying statement	30,240
Total ...	51,240

The balance of Rs. 55,000 — 51,240 = Rs. 3,760 cannot be utilized and is herewith surrendered.

4. It will be observed from Mr. Smyth's letter that he does not even *yet* know when he can submit the estimate for the Cooum Improvement Scheme, but *thinks* about 25th instant. Assuming this is the case, the estimate will be submitted from this office within a week of its receipt, and on the supposition that sanction to start work is received by Christmas, Mr. Smyth estimates that he can spend Rs. 1,45,000 within this official year. The Chief Engineer, to whom the estimates, when ready,

will be forwarded, will be able to say whether there is a reasonable probability of the estimate being sanctioned by Christmas, and a reference to him is advisable.

5. Assuming this to be so, I request that the grant of two lakhs may be redistributed as requested in paragraph 14 of Mr. Smyth's letter, and that the balance of Rs. 55,000 be redistributed as requested in paragraph 3 above of my letter, while Rs. 3,760 be withdrawn. If these transfers are approved, I request that very early intimation be made to me, in order that no time may be lost in instructing the Executive Engineer, Buckingham Canal, to make arrangements forthwith for spending the extra allotment of Rs. 30,240.

6. The fact that the grant for the Cooum scheme is given by the Irrigation office, while the estimate is to be sanctioned in the Works office, somewhat complicates matters, as such subjects are intimately connected and cannot be separated. I request therefore that points, such as that dealt with in the following paragraph, may be transferred, together with this letter, to the Works office, as soon as the necessary transfer of funds have been made in the Irrigation office.

7. I consider it absolutely necessary, in order to avoid delays that are almost certain to occur, that Mr. Pinto, Deputy Collector, be placed on special duty immediately the estimate for the Cooum scheme is sanctioned, in order to see that payments for compensation for land and buildings are *actually made* within this official year. Otherwise there is, in my opinion, certain to be a lapse of grant under this head, as there is usually protracted delay in making payments, and this delay is likely to be intensified in the case of land and buildings taken up in the heart of Madras. I therefore request that the Chief Engineer will be pleased to arrange that Mr. Pinto be placed on special duty from the date the Cooum Improvement estimate is sanctioned, and that I may be informed whether there is a reasonable probability of the estimate, if submitted by the end of this month, being sanctioned by Christmas, or whether delays are likely to occur owing to the necessity of references having to be made to the Government of India or Secretary of State. In this case it will of course be impossible to spend any portion of the grant for the Cooum scheme this year, and a further surrender will be necessary.

Enclosures.

From T. W. S. SMYTH, Esq., Executive Engineer, Cooum Improvement Scheme, to the Superintending Engineer, II Circle, dated 9th October 1895, No. 232.

Probable date of submission of estimate.—With reference to your demi-official of the 4th instant, I have the honour to report that I expect to resubmit the estimate for the Cooum Improvement Scheme about the 25th instant, provided I obtain the estimates for the railway bridge and harbour work in time.

2. *Deputy Collector's letter.*—I went to see the Deputy Collector, Mr. Chester, but he was unfortunately absent from office; he has however written a demi-official letter on the question of compensation, a copy of which I enclose.

3. *Land Compensation.*—The delay in settling for the land taken up for the Madras Railway does not promise well; this land must already have been occupied six months. I presume, however, that a payment into Court is expenditure against grant.

4. Out of the amount Rs. 1,35,300 * estimated for land compensation which will be slightly increased in the revised estimate, Rs. 69,281 will have to be paid over to the Military authorities, Rs. 31,690 to the Municipality, leaving Rs. 34,329 to be paid to private parties.

* In the Cooum Improvement estimate. (Intld.) A. S. R.

5. Expenditure is improbable on the first item, as the question must go to the Government of India, but I think expenditure very probable on item No. 2 as the money is mostly for the slaughter-house and land and huts near it, about which disputes are unlikely. I am very doubtful as to expenditure on the third item, and to be on the safe side, I would put total probable expenditure at Rs. 30,000; we can in any case either pay this sum on account to the Municipality or into Court.

6. *Special Revenue Officer.*—I do not think I need add anything to Mr. Chester's remarks regarding the appointment of a Special Revenue officer.

7. As regards other expenditure, my programme for the calendar year 1896 is based on the supposition that the estimate will be sanctioned in time to make contracts before Christmas.

It includes the following:—

(1) Bridge and regulator over the Cooum up to springing line of the arches.
(2) Works at St. Thomé.
(3) Weir on the Cooum.
(4) Basin lock.
(5) Basin road bridge.
(6) Tiruvattore road bridge.
(7) Excavating canal (part).
(8) Tools and plant.

There are other items which will not affect expenditure before the end of the current official year.

8. *Pumping machinery.*—To carry out this programme all pumping machinery must be at work early in the year, and if bought new will cost about Rs. 20,000. As some may be taken over from the Periyár at a reduced rate, I put probable expenditure at Rs. 15,000.

9. *Tramway for earthwork.*—For the execution of earthwork, I propose the purchase of a light tramway lying at Secunderabad belonging to Messrs. Molesworth and Co., who made use of it under me on the main canal Kistna Western delta. It consists, or *did* consist, of two engines, about 40 trucks, and 3 miles of rails, and I have just written for general information about its present state, probable cost, &c. I think I shall be fairly safe in estimating an expenditure of Rs. 25,000 on this plant. I have written to a partner in the late firm for information.

10. *Timber.*—I propose to purchase all the timber required for lining foundations, and for centring and for two temporary bridges over the Buckingham Canal to carry the tramway.

The cost will be —

	RS.
Timbering for foundations	8,000
Centrings	10,000
Bridges	2,000
Total ...	20,000

11. *Cement.*—For the foundations of the bridge at the mouth of the Cooum, about Rupees 20,000 worth of cement will be required, and on the other works an expenditure of Rs. 10,000 on the same account might be incurred.

12. *Coal.*—The estimates for unwatering foundations amount to over Rs. 13,000 and an expenditure of Rs. 5,000 may safely be incurred on coal.

13. *Other materials and works.*—It is unsafe to calculate much on other materials, as any thing will depend upon contractors who are (even the best) often very slow at starting, and part payments cannot be made on sinking foundations. Rs. 10,000, however, ought to be spent in one way or another. As regards the canal earthwork, the tramway ought to be in full work by the end of February at latest, even if it requires heavy repairs, and an expenditure of Rupees 10,000 may, I think, safely be depended upon.

14. *Total expenditure.*—Recapitulating, the probable expenditure is as follows :—

	RS.
Land and building compensation	30,000
Pumping machinery	15,000
Tramway	25,000
Timber for foundations	8,000
Do. for centring	10,000
Do. for temporary bridges	2,000
Cement	30,000
Coal	5,000
Materials and works	10,000
Earthwork	10,000
Total ...	1,45,000

15. *Balance of grant.*—The balance of the grant can easily be spent on purchase of cement for the work in the harbour, or on land compensation, provided no difficulties occur in getting sanction to the proposals with regard to the canal passing through the Rayapuram lines and the works in the harbour, but the former has to go to the Government of India (*vide* remarks by the General Commanding the Forces in G.O., No. 1365, dated 8th June 1895), and the latter, I believe, requires the sanction of the Secretary of State. Whether any expenditure should be incurred on the canal until these questions are settled, it is beyond my province to say.

From B. H. CHESTER, Esq., Deputy Collector, Madras, to the Executive Engineer, Cooum Improvement Scheme, dated 8th October 1895.

[Your demi-official of 7th instant.]

Land can be taken possession of 15 days after notification authorizing acquisition. The payment may be made at once or month after. It all depends on the nature of the claims put forth. The new Act allows us to deposit the money in Court, but it is always advisable to, if possible, come to terms with the owners, so that litigation may be avoided.

Mr. Pinto took up land for the Madras-Ennore Railway and questions of compensation are still pending in the Court in reference to some large claims. I certainly think a special officer will do the work quicker. I am over-worked. As it is I have a deal of land acquisition business to do for the Municipality in addition to my routine work, so that I could not give much time to acquiring land for the improvement scheme.

Dewan Bahadur A. Pinto, Deputy Collector of Mangalore, knows the value of the land you are likely to acquire, very well, as he was on duty in connection with the Madras-Ennore Railway. He is very quick in taking up land, &c., and perhaps you will be able to secure his services as special officer.

As regards transfers from Government and Military Department, I do not think there will be much delay. But as regards the Municipality, it is possible they will ask for compensation, and if so, time may be taken up in negotiatations.

Buckingham Canal Division.

Statement showing further grant that can be utilized this official year under "Capital" on works called for in Superintending Engineer, II Circle, No. 9 C., dated 9th October 1895.

Name of work.	Amount of estimate.	Existing grant.	Further grant now asked for.	Total required.	Remarks.
	RS.	RS.	RS.	RS.	
1. Constructing a tidal lock at Pambli.	12,500	8,880	2,000	10,880	
2. Constructing a tidal lock at Swarnamukhi.	13,850	..	5,000	5,000	For collecting materials and preparing gates, &c.
3. Constructing a tidal lock at Pyderu South flood gate.	12,800	10,560	2,240	12,800	
4. Constructing a tidal lock at Manniru North flood gate.	15,500	..	6,000	6,000	These amounts can be utilized on making gates, collecting cut stone and other materials and on cutting temporary diversions.
5. Constructing a tidal lock at Pabroo South flood gate.	12,800	..	6,000	6,000	
6. Constructing a tidal lock at Pálár South flood gate.	13,100	..	4,000	4,000	
7. Constructing a tidal lock at Voyalur flood gate.	..	..	5,000	5,000	
Total further grant now required.	..	..	30,240	..	

(Signed) J. LALOR,
Offg. Executive Engineer, B.C. Dn.

No. 195 I.

Submitted to Government.

2. The proposals of the Executive Engineer, Cooum Improvement Scheme, appear to be based on the assumption that it is of importance to spend the existing grant before the end of the current official year, and many of his proposed items of expenditure appear to be of more than doubtful expediency.

3. The subjoined statement compares Mr. Smyth's proposals with those of this office. It is suggested, for reasons given against each item, that instead of the proposed

surrender of Rs. 55,000 only a sum of Rs. 1½ lakh may be resumed from the grant of Rs. 2 lakhs.

Sub-head.	Grant as proposed by Mr. Smyth.	Grant as now proposed.	Remarks.
	RS.	RS.	
Land compensation	30,000	..	It is improbable that the municipality will provide new slaughter-houses in time for any expenditure to be incurred before the end of March and no expenditure is really necessary.
Machinery	15,000	15,000	No machinery or plant should be purchased without special sanction.
Tramway	25,000	25,000	
Timber	20,000	..	Timber can always be purchased in Madras as required and cut into scantling. It is not a good plan to lay in a large stock.
Cement (say 600 tons)	30,000	..	If local cement is used, no purchase need be made as the manufacturers will probably keep a reserve stock in their own sheds and issue as required.
Materials and works	10,000	..	A very doubtful item, as the estimate, pending the completion of the harbour, requires the approval of the Secretary of State.
Coal (about 200 tons)	5,000	..	No necessity to keep a stock. There will be no difficulty in obtaining any quantity likely to be required from the stock kept by merchants at the Harbour coal hoards.
Earthwork	10,000	5,000	No object in providing much as work is not in any case likely to be started until March and payments can be made in April.
Preliminary expenses	..	5,000	This may be necessary for marking out line, &c.
Total ..	1,45,000	50,000	

4. The additional grant of Rs. 30,240, or Rs. 37,195 including establishment required for the Buckingham canal, Capital account, may be appropriated from the proposed surrender of Rs. 1½ lakh, the balance of the amount available, viz., Rs. 1,12,805, being credited to the reserve under "43. Agricultural works," as shown in the margin, to meet probable demands which may be made later on in the year for additional funds for urgent works and for repairing monsoon damages.

Reserve—	RS.
Repairs	90,607
Establishment	20,839
Tools and plant	1,359
Total ...	1,12,805

5. The reduced grant for the Cooum Improvement scheme may be distributed by departmental heads as shown below :—

	RS.
Works ...	8,130
Establishment ...	1,870
Tools and plant ...	40,000
Total ...	50,000

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

25th October 1895.

Order—No. 971 I., dated 15th November 1895.

In the circumstances reported, the modifications of grants proposed in the foregoing endorsement of the Chief Engineer for Irrigation are sanctioned.

2. The Superintending Engineer, II Circle, will report what gauge he proposes to adopt for the proposed tramway and what engines and rolling stock he proposes to purchase.

3. Orders will issue hereafter on the other points raised by the Superintending Engineer.

4. His Excellency the Governor in Council desires to call attention to the excessive delay which has been allowed to occur in the preparation of the estimate for the entrance of the canal into the harbour which has to be prepared by the Engineer of the Harbour Trust Board. The matter should be expedited by the Chairman.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer, Public Works Department.
,, the Chief Engineer for Irrigation.
,, the Superintending Engineer II Circle.
,, the Chairman, Harbour Trust Board.
,, all other Superintending Engineers.
,, the Examiner, Public Works Accounts.
,, the Revenue Department.
,, the Financial Department.
,, the Local and Municipal Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O. No. 971 I., 15th Nov. 1895.

NOVEMBER.

Cooum Improvement Scheme

The proposed modifications of grants for the —, sanctioned, with remarks, and the attention of the Chairman, Harbour Trust Board, drawn to the excessive delay which has been allowed to occur in the preparation, by the Engineer of the Board, of the estimate for the entrance of the canal into the harbour.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following paper :—

From W. C. DeMorgan, Esq., Executive Engineer, Rushikulya Division, to the Superintending Engineer, I Circle, dated Camp Surada, 19th October 1895, No. 255 C.

I have the honour to request that you will kindly have the sources from which the following estimates have been sanctioned altered as indicated below against each :—

Name of work.	Amount of estimate.	Reference to Government Order sanctioning the estimate.	Provision from which sanctioned.		Provision to which debitable.	
			Item number of re-revised estimate.	Amount.	Item number of the re-revised estimate.	Amount.
	RS.			RS.		RS.
Sluice to No. 8 distributary, Rushikulya canal.	550	No. 799 I. of 22nd October 1894.	307	61,602	286	16,148
Sluice to No. 9 distributary, Rushikulya canal.	890	No. 438 I. of 28th May 1895.	307	61,602	286	16,148
Sluice to No. 14 distributary, Rushikulya canal.	540	No. 1047 I. of 22nd December 1894.	315	1,50,000	286	16,148
Minor masonry works No. 14 distributary.	3,920	Items 2 to 17 of "3 Works" G.O., No. 1047 I. of 22nd December 1894.	315	1,50,000	307	61,602
Sluice No. 1 distributary, Mahanadi canal.	570	No. 462 I. of 1st June 1895.	307	61,602	270	3,000

No. 754 G.N.

Submitted to the Chief Engineer for Irrigation for favour of compliance.

(Signed) A. H. GARRETT,
Superintending Engineer, I Circle.

30th October 1895.

Order—No. 973 I., dated 15th November 1895.

The proposed modification of the sources from which the items referred to were sanctioned is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

GENERAL.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O. No. 973 I., 15th Nov. 1895.

NOVEMBER.

Funds

The proposed modification of the sources from which certain estimates in the Rushikulya division were sanctioned, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 21st October 1895, No. 1639 G.D.

With reference to your No. 9 I., dated 7th September 1895, I have the honour to submit herewith a report* by Conductor Bennett, Superintendent, Government Workshops, Dowlaishweram, on the present condition of the dredger, and, under the circumstances therein stated, to recommend its conversion into a flat for carrying stone as proposed.

* Dated 10th October 1895.

ENCLOSURES.

REPORT on No. 1 double bucket ladder dredger.

	FT.	IN.
Length	85	9
Breadth	14	3
Depth	3	9

Hull.—The hull is in fair order.

Boiler.—The furnace crown plate is cracked and ten boiler tubes plugged up. Some of the brass mountings are deficient, such as plugs to gauge cocks and steam pipe, &c. An attempt was made to repair the boiler, but without success. Mr. Wade, boiler-maker of Kidderpur dockyard, when here in 1889 examined the boiler and condemned it as irrepairable.

Engine.—The machinery needs thorough overhauling and cleaning. A pump plunger, two glands, three pet cocks, one brass bearing are deficient. The probable cost of a new boiler and other repairs would be about Rs. 6,000. I am of opinion that it is not worth while spending so much on this dredge, as this dredge, being a double one, would require a punt on each side, making a total width of 34 feet which would be useless to dredge channels of 15 feet and 20 feet wide which, I believe, is now being done at the locks and different shoals. It may be useful for river dredging or channels over 34 feet wide.

Under these circumstances, I beg to suggest that this dredge be converted into a flat for conveying stone. This would cost about Rs. 2,000, and I think half this amount of conversion can be realized by the sale of the boiler and machinery. This dredge has not been at work for the last twelve years.

DOWLAISHWERAM,
10th October 1895.

(Signed) E. W. BENNETT,
Superintendent, Government Workshops.

Mr. Bennett's proposal to convert the hull into a flat is recommended.

(Signed) A. G. ROMILLY,
Executive Engineer.

10th October 1895.

Order—No. 974 I., dated 15th November 1895.

The proposal to convert the double bucket ladder dredger belonging to the floating plant of the Gódávari Eastern division into a flat and to sell the boiler and machinery, is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, I Circle.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O. No. 974 I., 15th Nov. 1895.

NOVEMBER.

Dredger

The proposal to convert the double bucket ladder — belonging to the floating plant of the Gódávari Eastern division into a flat and to sell the boiler and machinery, approved.

NOTIFICATION.

Fort St. George, 15th November 1895.

CLOSURE OF CANALS.

The canals of the Gódávari district will be closed for the periods shown below in 1896 :—

Canals.	Date of Closure.	Date of Re-opening.	Remarks.
Eastern Delta.			
Main Canal	20th April.	20th May.	Hour of closing, 6 A.M. Hour of re-opening, 6 P.M. For silt-clearance.
Bank ,, ...	20th April.	20th May.	
Cocanada canal	20th April.	20th May.	
Mundapett canal	20th April.	20th May.	
Coringa canal	20th April.	20th May.	
Injeram canal	20th April.	20th May.	
Kovur-Munjair junction canal	20th April.	20th May.	
Samalkot canal	20th April.	20th May.	
Western Delta.			
Main and other canals ...	2nd April.	15th May.	Do.
Central Delta.			
Main and other canals ...	1st April.	1st May.	Do.
Upper Gódávari.			
Dumagudem canal	15th Mar.	15th June.	

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 11th October 1895, No. 1545 G.D.

I have the honour to submit, for sanction, a statement showing the proposed closure of canals in the Gódávari district.

2. The dates of closure and re-opening have been settled in consultation with the Collector and the European Chamber of Commerce, Cocanada.

3. The Collector states that no reply has been received from the Native Chamber of Commerce.

Memo. to the Superintending Engineer, I Circle, dated 19th October 1895, No. I/105 G.D.
Letter from the Superintending Engineer, I Circle, dated 31st October 1895, No. 1726 G.D.

Order—No. 977 I., dated 15th November 1895.

The closure of canals in the Gódávari district proposed by the Superintending Engineer, I Circle, in his letter No. 1545 G.D., dated 11th October 1895, is sanctioned and the requisite notification will be published in the Fort St. George and Gódávari and Kistna District Gazettes until the 20th May 1896.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle.
,, Superintending Engineer, II Circle.
,, Revenue Department.
,, Superintendent, Gazette Press, with notification.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O. No. 977 I., 15th Nov. 1895.

NOVEMBER.

Closure of Canals

The — in the Gódávari district proposed by the Superintending Engineer, I Circle, sanctioned and the requisite notification ordered to be published in the Fort St. George, Gódávari and Kistna District Gazettes.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

Report on the estimate for constructing wooden fender pile foot bridge in front of head sluice, Bank canal, Kistna Western Division, amounting to Rs. 1220.

The design for the bridge has been modified from that of the Nallamada bridge to suit the conditions of the main canal in which the maximum water level and full supply level are the same.

The piles to be about 9 feet apart throughout from bank to bank. They are to have square ends bedded on a flat stone and fixed in pits dug for them, the pits being filled up with dry broken stone well rammed up to bed level.

The foot-way planking to be diagonal at an angle of 60° with 3″ intervals between planks with battens 2″ × 1½″ on them laid 2′ 6″ apart at right angles to the foot-way.

The railing standards are to be 5′ apart and to be fixed as shown on the enclosed tracing.

(Signed) S. A. SUBRAMANIA AIYAR,
6th October 1895. *for* Ex. Engr., Kistna Western Division.

From the Superintending Engineer, II Circle, dated 18th October 1895, No. 1522.

No. 215 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
14th November 1895. Chief Engineer for Irrigation.

ORDER—No. 978 I., dated 16th November 1895.

The following estimate is sanctioned from the provision of Rs. 3,390 made for item 530 of the comparative statement printed in Proceedings of Madras Government, No. 857 I., dated 11th October 1895:—

Capital expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Western Section.
I. Works.
2. Main Canals and Branches.
15. Miscellaneous.

Constructing a wooden fender pile foot bridge in front of the head sluice, Bank canal.

	RS.
Estimate	1,220

2. This sanction is registered as No. 137 I. of 1895-96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with three enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 16th.

Recd. *Encl.*

G.O. No. 978 I., 16th Nov. 1895.

NOVEMBER.

Bridge

Estimate of Rs. 1,220 for constructing a wooden fender pile foot — in front of the head sluice, Bank canal, Kistna Western delta, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From Lieutenant-Colonel D. McN. CAMPBELL, R.E., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 19th October 1895, No. 2292.

In forwarding herewith the marginally-noted completion reports I have the honour to request that you will be good enough to obtain the sanction of Government to the outlay incurred in excess of the sanctioned estimates.

1. Ramasagar channel improvements.
2. Basavanah „ „
3. Chickatambalam Karim Sahib tank repairs.

Full explanation is given in the reports regarding the excess.

Office-note to the Examiner of Public Works Accounts, dated 25th Oct. 1895, No. 270.
„ from the „ „ „ „ 2nd Nov. „ „ 3840 D./A.

No. 211 I.

Submitted to Government with a recommendation that the excesses shown to have been incurred on the following works be sanctioned :—

—	Sanctioned estimate.	Outlay.	Excess.
	RS.	RS.	RS.
1. Ramasagar channel improvements	22,700	24,638	1,938
2. Basavanah „ „	10,100	15,462	5,362
3. Chickatambalam Karim Sahib tank repairs ..	1,585	2,322	737

2. The excess on item 1, which was completed in March 1895, is chiefly due to the pay of the channel superintendents and their establishments having been charged to the work. The excess on item 2 is due partly to the same cause and partly to the lump sums provided in the original estimate for Doulton's glazed pipe-sluices and for repairs to sluices, &c., having been found inadequate. This work was completed in June 1894. The 3rd item was completed in 1891. The excess is attributed to raising the revetment to top of level of bank and to extra work found necessary at the surplus escapes.

3. Revised estimates should have been submitted * for the works before their completion, and the great delay in applying for sanction to the excesses incurred on them should not have been allowed to occur after their completion.

* *Vide* chapter III, paragraph 43, Volume I, Public Works Department Code.
Vide chapter II, paragraph 170, Volume II, Public Works Department Code.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

11th November 1895.

ORDER—No. 979 I., dated 16th November 1895.

The Examiner of Public Works Accounts is authorized to admit the excess expenditure incurred on the works referred to.

2. This sanction is registered as No. 136 I. of 1895-96.

3. The attention of the Superintending Engineer, III Circle, is drawn to paragraph 3 of the foregoing endorsement of the Chief Engineer for Irrigation and he will see that a recurrence of similar irregularities is avoided as much as possible in future.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle, with five enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 16th.

Recd. *Encl.*

G.O. No. 979 I., 16th Nov. 1895.

NOVEMBER.

Excess Expenditure

The Examiner, Public Works Accounts, authorized to admit the — incurred on certain works in the Bellary division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Superintending Engineer, II Circle, dated 5th June 1895, No. 182 N.L.

To the Superintending Engineer, II Circle, dated 12th June 1895, No. 23 N.L.

From the Executive Engineer, Nellore Division, to the Superintending Engineer, II Circle, dated 7th October 1895, No. 281 S.E.

With reference to your No. 233 N.L., dated 28th June 1895, I have the honour to append the expenditure and revenue on Ramasagaram Ramanayadu tank in Rapur taluk.

	Expenditure.	Collection.		
	RS.	RS.	A.	P.
1890–91	*Nil.*	39	3	6
1891–92	*Nil.*	274	9	6
1892–93	*Nil.*	700	0	6
1893–94	*Nil.*	574	0	6
1894–95	490	561	9	11
Proposed expenditure	2,860	...		
Total ...	3,350	2,149	7	11 (or Rupees 2,150).

It will thus be seen that the expenditure exceeded the collection.

Enclosure.

Report to accompany the plans and estimates for Ramasagaram Ramanayadu tank (No. 186 of Imperial list of tanks) improvements—Ayacut, Acs. 205. Assessment, Rs. 1,041.

	RS.
Amount of estimate	2,800

This is a terminal tank of the Ramasagaram group. This is purely a rain-fed tank and receives the surplus of the Molacalapundla tank. This tank was breached in several places during the floods of November 1893. The breaches were temporarily closed and the weir partly repaired and a temporary byewash has been constructed from an estimate for Rs. 490 sanctioned for execution in 1894–95. The tank-bund is very low in some places. The tank had two weirs—one at the northern end, and the other at the southern end. The northern one was completely wrecked in 1893. The wing of the southern one was also gone, but was repaired lately. It is proposed to close the breach at the northern end and to build a new weir in place of the temporary byewash. The surplus falls into the Vengatagiri river. There are two sluices which have got leaky heads. These will be remodelled and provided with screw-gearing shutters. The capacity of the tank is 27·54 millions; supposing the tank to be filled twice, it can irrigate 275 acres.

The present average cultivation is 137 acres with an assessment of Rs. 625. The ayacut and revenue being 200 acres and Rs. 1,041, respectively, there will be an increase of revenue of Rs. 416. The expenditure proposed is Rs. 3,444, inclusive of establishment charges and tools and plant. The return to Government will be 12·70 per cent.

(Signed) R. A. SRINIVASA AIYANGAR,
Executive Engineer, Nellore Division.

16th May 1895.

No. 410 N.L.

Submitted to the Chief Engineer for Irrigation with reference to his No. II/23 N.L., dated 12th June 1895.

(Signed) A. S. RUSSELL,
Offg. Suptg. Engr., II Circle.

13th October 1895.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

ORDER—No. 980 I., dated 16th November 1895.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.
Improving Ramasagaram Ramanayadu tank No. 186 of list of works in the Nellore division, appended to G.O. No. 407 I., dated 6th July 1887.

	RS.
Estimate	2,860

2. This sanction is registered as No. 138 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle, with four enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 16*th*.

Recd. *Encl.*

G.O. No. 980 I., 16th Nov. 1895.

NOVEMBER.

Tank

Estimate of Rs. 2,860 for improving Ramasagaram Ramanayadu —, Nellore division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From W. HUGHES, Esq., Superintending Engineer, VI Circle, to the Chief Engineer for Irrigation, dated Trichinopoly, 30th October 1895, No. 1169 T.C.

I have the honour to request that the following modification of allotments in the Trichinopoly division may be sanctioned at your earliest convenience :—

Item number.	—	Existing grant.	Modification of allotments applied for.		Modification of allotments proposed.	
			Reduction.	Increase.	Reduction.	Increase.
	IRRIGATION.	RS.	RS.	RS.	RS.	RS.
	43. *Minor Works and Navigation.*					
	Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.					
1	Original Works—Minor (lump sum)	15,600	1,000	..	1,000	..
2	Repairs (lump sum)	22,000	1,500	..	1,500	..
	Agricultural Works.					
3	Original Works—Minor (lump sum)	5,500	1,500	..	1,500	..
	Minor Works for which Capital and Revenue Accounts are kept.					
	Capital.					
4	Nandyar extension, estimates Rs. 42,500 sanctioned in G.O., No. 275 I., dated 23rd March 1895	14,150	..	28,350	..	28,350
	Revenue.					
5	Minor extensions and improvements (lump sum) ..	..	..	1,450	..	1,450
6	Maintenance and Repairs (lump sum)	..	..	610	..	610
	Total ..	..	4,000	30,410	4,000	30,410

2. *Items* 1 *to* 3.—Surrendered to meet in part the demands in items 4 to 6, as the amounts cannot possibly be spent, owing to the season being unfavourable and want of estimates.

Item 4.—Owing to the write back of Rs. 26,956 expended, under the head 43. Minor Works, &c., not kept, Public Works Department, during the previous years when the work was classed under that head, the expenditure has exceeded the allotment for the current year. Hence the demand.

Items 5 *and* 6.—The amount of estimates sanctioned under these heads during the current year is Rs. 2,060, and there is no allotment under the heads concerned.

Order—No. 982 I., dated 18th November 1895.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.

From
Trichinopoly Division.
Minor Works for which neither Capital nor Revenue Accounts are kept,
P.W.D.
Ordinary Works.

	RS.	RS.
Major Original Works ...	26,956	
Minor Original Works ...	1,000	
Repairs	1,500	
	29,456	
Establishment	6,775	
Tools and plant	442	
		36,673
Agricultural Works.		
Minor Original Works ...	1,500	
Establishment	135	
Tools and plant	9	
		1,644
Total ...		38,317

To
Trichinopoly Division.
Minor Works for which Capital and Revenue Accounts are kept.
Nandyar Channel Extension.
Capital Account.

	RS.	RS.	RS.
Works	28,350		
Establishment ...	6,521		
		34,871	
Revenue Account.			
Extensions and improvents ..	1,450		
Maintenance and repairs	610		
	2,060		
Establishment ...	474		
		2,534	
			37,405
Agricultural Works.			
Reserve—Repairs			912
Total ...			38,317

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 18th.

Recd. *Encl.*

G.O. No. 982 I., 18th Nov. 1895.

NOVEMBER.

Funds

Certain transfers of — in the Trichinopoly division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers:—

No. 125 I.

Note by the Chief Engineer for Irrigation.

The accompanying précis of the correspondence which has taken place regarding the improvement of irrigation in the Ráyachóti taluk of the Cuddapah district is forwarded for information.

2. To carry out His Excellency's proposal would, as the Superintending Engineer points out, require such a distribution of water-supply that a thorough and detailed investigation of existing rights as well as engineering possibilities would be necessary.

3. In the opinion of the undersigned, the advantages to be gained by such an investigation are not commensurate with the cost of investigation and the dissatisfaction which would certainly be caused by the interference with existing rights. It is suggested, therefore, that the matter may now be allowed to drop.

Dowlaishweram, (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
20th July 1895. Chief Engineer for Irrigation.

Enclosure.

Precis of the correspondence regarding improvements to tanks in the Ráyachóti taluk, Cuddapah district.

His Excellency the Governor having, on his tour in the Ráyachóti taluk of the Cuddapah district during August 1891, suggested the desirability of reducing the number of very small tanks in that taluk and increasing their size thereby lessening the loss from evaporation and other causes, the Superintending Engineer, III Circle, was in memo. No. 23 C.D., dated 27th September 1891, called upon for a report, the number of tanks being 821, with an average ayacut of less than 20 acres each.

2. In his letter No. 3005, dated 8th February 1893, the Superintending Engineer reported that small tanks help to maintain the level of water in the wells upon which much of the cultivation depends and that the substitution of direct tank irrigation for the wells might interfere with the sub-soil drainage which the wells promote. He also reported that such a scheme, if carried out, would enormously benefit the taluk as a whole, but would cause such a redistribution of existing water-supply that the most thorough and detailed study of existing rights as well as engineering possibilities must be made before anything is done.

3. In letter No. 3 C.D., dated 17th February 1893, this report was referred to the Collector for opinion.

In his letter No. 1428, dated 12th April 1893, the Collector reported—

(*a*) that the ryots value much the small tanks, many of which are dasabandam requiring compensation, should they be done away with;

(*b*) that 25 out of 296 Government tanks, one out of eight private tanks, and 37 out of 467 dasabandam tanks were out of repair; and

(*c*) that two sites for large reservoirs are available—one at Brahmana Yerragudi near where the road from Pulivendla enters the taluk, and the other where the Piler river enters it.

4. In letter No. 6 C.D., dated 18th April 1893, the Collector was informed that it was not intended to throw out of cultivation any existing wet lands and he was asked to suggest any suitable sites for large reservoirs which would command a considerable area of land now irrigated from small tanks.

5. Supposing that in lieu of small tanks it was intended to make reservoirs at the heads of valleys, the Collector stated in his letter No. 3010, dated 3rd July 1893, that the valleys are generally filled with tanks, as large as and even larger than their catchment areas warrant, that by doing away with the lower tanks, the surface drainage and jungle-streams which feed such tanks could not be utilized, and that he could not suggest any sites for reservoirs other than the two already mentioned.

6. In letter No. 15 C.D., dated 5th July 1893, it was again pointed out to him that he was not right in his supposition and that the proposal was, in a village which has, say, three tanks, to improve one tank so as to irrigate the ayacut of the three tanks and also the beds of the two which might be abandoned.

7. In his letter No. 3066, dated 22nd July 1893, the Collector reported that the upper tanks have not apparently sufficient catchment area to irrigate the ayacuts and the beds of the lower tanks in addition to their own ayacuts, that the supply of water in wells depends on the distance from the tanks and not simply on the depth of water in them and that, on receipt of certain information from the Sub-Collector, he would see if the suggested improvements could be carried out in any particular locality and intimate the results.

8. In his letter No. 3028, dated 5th July 1894, the Collector reported that, in order to give a trial to the proposed improvements, the Sub-Collector selected Yendapalli village which contains the eight Government tanks shown below and indicated on the accompanying sketch-map :—

(1) Kotta cheruvu.	(5) Venganaya kunta.
(2) Reddi kunta.	(6) Byranni cheruvu.
(3) Tatimakula kunta.	(7) Varadapa kunta.
(4) Chinna Venganaya kunta.	(8) Kotta kunta.

9. The Sub-Collector proposed to enlarge the first tank (fed by Vepulgi vanka) so as to irrigate the ayacuts and beds of tanks Nos. 2, 6, 7 and 8, the bunds of which he proposed to breach. Tanks Nos. 3, 4 and 5 which are in high level, he proposed to retain.

10. This proposal was by endorsement No. 32 C.D., dated 17th July 1894, referred to the Superintending Engineer for report and with letter No. 876, dated 25th June 1895, he submitted the Executive Engineer's report on the Sub-Collector's proposal with the remark that there was no advantage in adopting the proposed scheme. The catchment area of the tank proposed to be enlarged is reported to be 10 square miles, and its ayacut 115 acres. It surpluses into the tank No. 6, a narrow shallow tank 1¾ miles below, chiefly fed by a supply channel from Botla cheruvu vanka and with a catchment of 3 square miles. Its ayacut of 116 acres is fully cultivated and there are 30 wells below it which are used when the tank supply fails. If this tank be abandoned, the drainage in its catchment and the discharge of its supply channel will not be utilized and the water level in the wells will be lowered. Between tanks Nos. 1 and 2 there is a low hill, and a small vagu which supplies latter could not be diverted to tank No. 1. Tanks Nos. 7 and 8 which irrigate lands across the Botla cheruvu vanka cannot be superseded by tank No. 1.

11. With the letter above-quoted, the Superintending Engineer submitted two letters of August 1892 from the Sub-Collector suggesting two sites for large reservoirs on the Madduleru river—the one immediately above and within a quarter mile of Nakkalenpalli, a hamlet of Dorigallu in Kadiri taluk, and the other on the Balnida river at Agraharam 6 miles below Mushtur.

In letter No. 3279, dated 10th March 1893, the Superintending Engineer informed the Collector that, in his opinion, both these reservoir projects are impracticable.

Endorsement to the Revenue Department, dated 7th August 1895, No. 2457 C.

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 10th September 1895, Mis. No. 4815.

Read—G.O., Mis. No. 3218, Revenue, dated 12th August 1895.

Resolution—dated 10th September 1895, Mis. No. 4815.

With reference to the Government Order read above, the Board begs to report that in the Ráyáchoti taluk there are 2,944 wells (in wet ayacuts *) which are used for supplementing irrigation from Government tanks, &c. There are also 5,066 wells, which have separate ayacuts of their own. Of these, 2,679 are dasabandam wells and the remainder (2,387) private wells.

* Irrigable areas.

2. The total area—Government and Inam—irrigated by wells having separate ayacuts in this taluk is given at 8,572 acres under first-crop and 807 acres under second-crop.

(True Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

Endorsment from the Revenue Department, dated 28th October 1895, No. 4227.

No. 210 I.

Note by the Chief Engineer for Irrigation.

The Chief Engineer for Irrigation is not sanguine that any advantage will be gained by investigating the irrigation sources in Ráyachóti taluk with a view to reducing the number and increasing the size of tanks; but, since this investigation is considered by Government to be advisable, is of opinion that a temporary Tank Restoration Scheme Party may be started under an experienced Upper Subordinate. After the country has been mapped and any likely sites for reservoirs inspected, the further investigation of the project can be considered.

2. The proposed work will not be wasted as, if it is decided that the larger project should be abandoned, the ordinary Tank Restoration Scheme investigation can be completed.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

11th November 1895.

ORDER—No. 983 I., dated 18th November 1895.

The proposal of the Chief Engineer for Irrigation is approved.

2. A proposition statement for the necessary establishment will be submitted for sanction at an early date.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Chief Engineer, Tank Restoration Scheme.
„ Superintending Engineer, III Circle
„ Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 18th.

Recd. *Encl.*

G.O. No. 983 I., 18th Nov. 1895.

NOVEMBER.

Irrigation sources in Rayachoti Taluk

Approving the proposal of the Chief Engineer for Irrigation that a temporary Tank Restoration Scheme Party be started under an experienced Upper Subordinate to investigate the —, Cuddapah district, with a view to reducing the number and increasing the size of tanks in the taluk.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

No. 214 I.

Note by the Chief Engineer for Irrigation.

The accompanying estimate of Rs. 3,570 for repairing No. 1 Kogavakkamhissa large tank in the Arni river, upper minor basin, Tiruvallúr taluk, Chingleput district, is submitted to Government with a recommendation that it may be sanctioned as a contribution work.

2. The tank irrigates 1,466 acres in the nine Government villages noted in the margin, and 263 acres of shrotriem lands in No. 203, Doddareddikuppam village. The shrotriemdar has to pay a contribution of Rs. 676 towards the cost of repairs, as detailed in the margin, which should be collected before the work is put in hand.

1. No. 159, Tulvada village.	6. No. 196, Ariyapakkam.
2. „ 161, Kogavakkam.	7. „ 197, Attupakkam.
3. „ 162, Tandalam.	8. „ 198, Balesvaram.
4. „ 163, Tumpakkam.	9. „ 202, Vannankuppam.
5. „ 164, Parithimanikuppam.	

	RS.
Contribution due on the amount of estimate $\frac{3570 \times 263}{1729}$ =	543
Establishment and tools and plant charges at $24\frac{1}{2}$ per cent. ..	133
Total	676

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

13th November 1895.

ENCLOSURE.

REPORT to accompany the estimates of No. 1 Kogavakkamhissa large tank, Tiruvallúr Taluk, Chingleput District.

Surplus arrangement.—The tank has a paved byewash 126 feet long between C.S. Nos. 6 and 12, and a weir 124 feet long between C.S. Nos. 16 and 18 near the left flank. The weir is in good order.

The byewash built entirely of loose laterite stone is in very bad order. Nearly 60 feet of its length has been scoured out by floods and the site is more suitable for a masonry weir than for a byewash the ground in rear being much below the crest level.

It is therefore proposed to replace the byewash by a masonry weir 126 feet long as per plan accompanying.

An estimate for converting this byewash into a weir was prepared and sanctioned during 1892–93 by the Superintending Engineer in his Register No. 45 of 1892–93, but the work was not put in hand. As the present estimate provides for the complete repairs of the tank, the estimate sanctioned by the Superintending Engineer will be cancelled.

Sluices.—Irrigation is carried on by four masonry sluices. Sluice No. 1 from left flank is in fair order, requiring but slight repairs to its front face wall and raising the rear cistern walls to suit the proposed section of the bund, for which a lump sum of Rs. 30 is allowed in the estimate.

Sluices Nos. 2 and 3 are of old pattern and are reported to be leaky. They will be examined and repaired from lump sum provision of Rs. 50 and Rs. 30, respectively, allowed in the estimate.

Sluice No. 4 is in working order, but its tunnel being short will be extended in rear and a cistern added to it, for which a lump sum of Rs. 50 is allowed.

Bund.—The bund is low and cut up in places. It is therefore proposed to raise it to 3 feet above M.W.L. with 4 feet top width between C.S. Nos. 4 to 14 and Nos. 37 to 43, to 4 feet above M.W.L. with top width of 5 feet between C.S. Nos. 14 to 19 and Nos. 31 to 37, and the intervening portion between C S. Nos. 19 to 31 to 5 feet above M.W.L. with 6 feet top width. The side slopes will be 2 to 1 throughout.

Turfing.—The soil throughout being very loose earth, both the slopes of the bund will be turfed.

Revetment.—The deep portion of the bund between C.S. Nos. 20 and 33 is revetted. The revetment at the breach between C.S. Nos. 28 and 30 (a length of 54 feet), and on either side of sluice No. 1 being low and partly washed away will be repacked to M.W.L.

Supply channel.—The tank is fed by a supply channel taking off the left bank of the Arni river near No. 154, Kavanur village. The channel is in fair order and has a sluice at its head with a vent 6' × 8¼' which is provided with needle shutters and in good order.

The tank irrigates 1,729 acres in ten villages, of which 263 acres belong to a shrotriem village (No. 203 Doddareddikuppam). The contribution due by the shrotriemdar towards the cost of repairing the tank amounts to Rs. 676 including usual charges for tools and plant and establishment. The work will be put in hand after the contribution is recovered.

(Signed) F. W. ASHPITEL,
for Chief Engineer for Irrigation,
Tank Restoration Scheme.

ORDER—No. 990 I., dated 19th November 1895.

The following estimate is sanctioned, Rs. 676 of the proposed outlay being contributed by the shrotriemdar concerned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Tank Restoration Works.
Repairs.

Repairing Kogavakkamhissa large tank No. 74 of list of works in the Chingleput division appended to G.O. No. 407 I., dated 6th July 1887.

	RS.
Estimate	3,570

2. This sanction is registered as No. 139 I. of 1895-96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Chief Engineer, Tank Restoration Scheme, with ten enclosures.
,, Superintending Engineer, V Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 19th.

Recd. *Encl.*

G.O. No. 990 I., 19th Nov. 1895.

NOVEMBER.

Tank

Estimate of Rs. 3,570 for repairing Kogavakkamhissa large — in the Chingleput division, sanctioned, Rs. 676 of the amount being contributed by the shrotriemdar concerned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From J. HANNAN, Esq., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated 12th October 1895, No. 227 I.

I have the honour to submit, for your approval and sanction of Government, a plan and supplemental estimate amounting to Rs. 500 for bridge and Regulator No. 2 in Cheyar main channel.

Necessity for this estimate is stated in the report accompanying.

The original estimate of Rs. 2,760 for constructing the regulator No. 2 was sanctioned in G.O. No. 855 I., dated 6th October 1893.

No. 218 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

15th November 1895.

Order—No. 991 I., dated 19th November 1895.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Cheyar Anicut System.
Capital Account.
2. Main Canals and Branches.
3. Regulators.
Cutting half vertically the three larger shutters of No. 2 Regulator and providing another screw-gearing to each of the shutters so cut.

	RS.
I. Works ...	500
II. Establishment ...	115
III. Tools and plant ...	5
Total estimate ...	620

2. This sanction is registered as No. 140 I. of 1895–96.

3. The attention of the Superintending Engineer, IV Circle, is drawn to the remarks made on the plan by the Chief Engineer for Irrigation.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle, with four enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 19th.

Recd. *Encl.*

G.O. No. 991 I., 19th Nov. 1895.

NOVEMBER.

Shutters

Estimate of Rs. 620 for cutting half vertically the three larger — of No. 2 Regulator and providing another screw-gearing to each of the shutters so cut, Cheyar main channel, North Arcot division, sanctioned with remark.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 2nd November 1895, No. 770 G.N.

I have the honour to submit, herewith, a completion report for the work "Russellkonda reservoir head sluice" as well as a completion report for a wooden bridge at Nandajola, received from the Executive Engineer, Rushikulya division, and verified by the Examiner of Public Works Accounts.

2. Rupees 45,850 and Rs. 1,500 have been provided for the above works in the re-revised estimate of the project printed with G.O. No. 13 I., dated 10th January 1894 (*vide* items Nos. 24 and 153).

3. The amount of Rs. 3,657 being savings effected on the works may be added to the provision for unforeseen works of the project.

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 4th November 1895, No. 771 G.N.

I have the honour to submit, herewith, a completion report of works for July 1895, received from the Executive Engineer, Rushikulya division, and verified by the Examiner of Public Works Accounts.

2. The net excess expenditure on the works referred to is Rs. 82 and reasons for the same are given by the Executive Engineer in the remarks column of the report.

3. I therefore request that you will be good enough to move Government to authorise the Examiner to admit the excess.

No. 219 I.

Submitted to Government.

The net saving realized on the works entered in the completion reports amounts to Rs. 3,575 as shown below and may be credited to the balance available for unforeseen works :—

—	Estimate.	Outlay.	Savings.
	RS.	RS.	RS.
1. Russellkonda reservoir head sluice	45,850	42,293	3,557
2. Mahanadi canal wooden bridge at Nandajolu	1,500	1,400	100
3. Rushikulya canal head sluice to No. 8 Distributary	550	595	— 45
4. Skew bridge to carry Aska-Berhampur road over Ichchhápuram channel	2,060	2,154	— 94
5. Flush outlet at $5\frac{1}{8}$ miles + 40 feet Ichchhápuram channel	770	713	57
Total ..	...	..	3,575

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

15th November 1895.

ORDER—No. 992 I., dated 19th November 1895.

The Examiner of Public Works Accounts is authorized to admit the outlay incurred on the works referred to, the net saving of Rs. 3,575 being added to the balance available for unforeseen works of the Rushikulya project, which will then be increased to Rs. 58,532.

2. This sanction is registered as No. 141 I. of 1895-96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 19th.

Recd. *Encl.*

G.O. No. 992 I., 19th Nov. 1895.

NOVEMBER.

Expenditure

The Examiner of Public Works Accounts authorised to admit the — incurred on certain works in the Rushikulya division, the net saving of Rs. 3,575 on the works being added to the balance available for unforeseen works of the project.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

No. 209 I.

Note by the Chief Engineer for Irrigation.

In the original estimates for the Rushikulya project in the Ganjám district, submitted with Proceedings of Madras Government No. 377 I., dated 8th May 1882, and sanctioned by the Secretary of State in his Despatch No. 25, Public Works, dated 26th April 1883, printed in Proceedings of Madras Government No. 500 I., dated 23rd June 1883, it was proposed to form, at an estimated cost of Rs. 2,60,950, a reservoir of 2,160 millions of cubic feet immediately below the town of Surada by constructing a dam 3,604 feet long and 45 feet high across the Johoro river about 1,000 yards above its junction with the Rushikulya river in order to supplement the supply in the latter. Some difficulty was, from the first, anticipated in putting in the foundation where the proposed line of embankment crosses the river.

2. After numerous borings it was found that for upwards of 150 feet in length no hard soil could be reached within 40 to 50 feet below the bed of the river where the maximum depth of water would be 40½ feet. It was therefore considered too risky to construct the bund at the proposed site with the appliances available and work was stopped at the end of 1887. An alternative line along the left margin of the river to a point some three miles higher up was then adopted, and the bund carried across the river to divert the Pathama, an affluent of the Johoro river through a cutting into the reservoir. At this point the maximum depth of water would be only, 17½ feet and by this modification of the scheme the capacity of the reservoir was reduced from 2,160 to 1,755 millions of cubic feet.

3. Work was resumed in October 1891. The estimated cost of the work as altered amounted to Rs. 5,36,008 and was provided for in the revised estimates of the project submitted to the Government of India with Proceedings of Madras Government No. 482 I., dated 4th September 1890, and sanctioned by the Secretary of State in his despatch communicated by the Government of India with its letter No. 69 I., dated 2nd May 1891, printed in Proceedings of Madras Government, No. 419 I., dated 19th May 1891. The estimate for the project was again revised in 1894 and the amount provided for the Surada reservoir remained practically unaltered.

4. The following statement shows the sanctioned estimates and the expenditure incurred on the reservoir to end of August 1895 :—

Sub-head.	Name of work.	Original estimate—Proceedings of Madras Government No. 377 I. of 8th May 1882, and No. 500 I. of 23rd June 1883.	Revised estimate—Proceedings of Madras Government No. 482 I. of 4th September 1890, and No. 419 I. of 19th May 1891.	Revised estimate—Proceedings of Madras Government No 13 I. of 10th January 1894, and No. 846 I. of 7th November 1894.	Expenditure to end of August 1895.	Remarks.
		RS.	RS.	RS.	RS.	
1. Preliminary expenses.	Clearing jungle	..	3,900	2,900	2,700	
2. Land ..	Compensation for land, &c.	30,000	1,16,798	1,16,798	1,09,017	
3. Works ..	Embankment	1,59,000	2,83,000	2,75,000	2,04,843	
	Bank from Roman Catholic chapel to waste weir.	8,590	..	..	..	
	Coffer dam	12,050	..	..	..	
	Channel to take the Pathama river into the reservoir.	..	42,160	41,160	19,083	
	Head sluice	28,700	28,700	26,000	17,730	
	Supply channel	1,510	..	..	..	
	Channel from head sluice to Johoro river.	..	3,000	3,000	2,071	
	Weir on original line of supply channel ..	3,310	3,424	3,555	3,355	Abandoned.
	Weir on new do. do. ..	..	3,400	..	..	Not required.
	Waste or surplus weir	23,710	35,000	42,400	41,265	
	Waste weir channel	24,080	15,000	21,800	9,572	
	Surada and Papilanka road diversion ..	..	..	1,500	..	
	Flush escape	..	..	370	370	
	Flood bank	..	..	274	274	Abandoned.
4. Buildings ..	Rest-house	..	1,050	1,050	1,050	
5. Miscellaneous.	Boundary stones and pillars	..	500	500	..	
6. Maintenance.	Rest-house and store shed repairs ..	..	76	723	723	
	Total ..	2,90,950	5,36,008	5,36,930	4,12,053	

The reservoir is seven-eighths done, the head sluice nearly so, and the surplus weir quite finished and the channels nearly half finished.

5. The Superintending Engineer now reports that the soil, of which certain parts of the embankment are formed, is very treacherous and that there are numerous slips which may necessitate its final abandonment.

6. The undersigned is, however, not disposed to accept this gloomy view until after the close of the north-east monsoon, when he intends to inspect the reservoir. This is not the first time that slips have occurred and it is hoped that means may yet be found to make it answer the purpose for which it was originally constructed. At all events there is no necessity to abandon the work until it has been conclusively shown that it cannot be retained except at a prohibitive cost.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

11th November 1895.

ORDER—No. 994 I., dated 19th November 1895.

The Chief Engineer for Irrigation will inspect the reservoir as soon as possible after the close of the north-east monsoon and will submit a full report to Government.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 19th.

Recd. *Encl.*

G.O. No. 994 I., 19th Nov. 1895.

NOVEMBER.

Surada Reservoir

The Chief Engineer for Irrigation directed to inspect the — as soon as possible after the close of the north-east monsoon, and to submit a full report to Government.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From N. F. MACKENZIE, Esq., Under Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Simla, the 5th November 1895, No. 271 I.

I am directed to acknowledge the receipt of the Proceedings of the Government of Madras, No. 689 I., dated the 27th August 1895, copy forwarded with your No. 690 I. of the same date, and, in reply, to communicate the sanction of the Government of India to the estimate, amounting to Rs. 16,000, including percentages on account of establishment and tools and plant, for providing screw-gearing shutters for the Kanigiri reservoir, Sangam Anicut project, chargeable to the open Capital Account of the project. A further communication will be made hereafter regarding the incidence of cost.

2. The sanction accorded in this letter has been registered as No. 21 I. of 1895-96, and the original estimates forwarded with the Proceedings of the Madras Government under acknowledgment are returned herewith.

ORDER—No. 998 I., dated 20th November 1895.

Communicated to the officers concerned with reference to G.O. No. 689 I., dated 27th August 1898.

2. This sanction is registered as No. 142 I. of 1895-96 and will expire on 31st March 1898.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with nine enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 20th.

Recd. *Encl.*

G.O. No. 998 I., 20th Nov. 1895.

NOVEMBER.

Kanigiri Reservoir, Sangam Anicut Project

Government of India sanction to the estimate of Rs. 16,000 for providing screw-gearing shutters for the —, communicated to the officers concerned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Superintending Engineer, IV Circle, dated 8th March 1895, No. 48 E.I.
To the " IV " " 18th " " " 30 N.A.

From J. Hannan, Esq., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Ootacamund, 1st August 1895, No. 158 I.

With reference to your memo. No. IV/30 N.A., dated 18th March 1895, I have the honour to submit, for sanction of Government, five revised estimates aggregating to Rs. 4,350 for restoring Kadaladi old tank No. 216-A and its supply channel.

It will be observed from the accompanying comparative statement that there will be an excess of Rs. 300 over the original amount, viz., Rs. 4,050, sanctioned in G.O. No. 714 I., dated 17th August 1893.

Enclosure.

Report to accompany the revised estimate for restoring the bund of No. 216-A, Kadaladi old tank.

According to the original sanctioned * estimate, earthwork for bund from section 1 to 26, revetment for the same sections to the level of 53·00 or 1 foot above F.T.L. and one new sluice were completed. The accompanying revised estimate has been prepared on the lines of the Executive Engineer's orders † (herewith returned) and embraces the following items of work :—

* The original estimate of Rs. 4,050 was sanctioned in G.O. No. 714 I., dated 17th August 1893.
† *Vide* Irrigation Chief Engineer's memo. No. IV/30 N.A., dated 18th March 1895.

(1) The F.T.L. of tank has been reduced to the level of 50·00 and the bund will be raised to the level of 55·00 from section 26 to 37.

(2) The breach will be closed to the level of 55·00 with a top width of 12 feet and slopes 1½ to 1. The front slope of the breach will be protected with stone revetment with a slope of 1 to 1 to the level of 53·00; jelly packing 6 inches in thickness behind the stone revetment has also been provided.

(3) The construction of a weir for the tank has been abandoned and a natural bye-wash has been provided where the ground is very hard and gravelly.

The burnt stone collected for the construction of No. 2 sluice will be utilized in forming a paved bye-wash at C.S. No. 42 to a length of 150 feet.

(4) The old channel from Kadaladi large tank will be excavated as per accompanying sections. A masonry calingula at the head of the channel is necessary both to divert water to the tank and to discharge the surplus. It has been ascertained that no harm will be done to Kadaladi small tank by diverting a portion of the surplus of Kadaladi large tank from it. The former receives an efficient supply from springs and the field drainage of Kadaladi large tank. Hydraulic and other informations are fully detailed in the sections. The above-mentioned works, if carried out, will enable the tank to store a quantity of water to the level of 50·00 or two feet below the originally proposed F.T.L. of tank, provided that sufficient water is found available, but it is not probable.

It should be noted that the catchment area originally given was largely over-estimated. That now given is correct, viz., ½ square mile.

All works are to be done as specified in the standard specification of the Public Works Department.

(Signed) H. E. CLERK,
Executive Engineer, North Arcot Dn.

No. 213 I.

Submitted to Government.

The top width of the channel bank has been increased in this office from 3′ to 4′ and a simple pavement has been substituted for the proposed bye-wash.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

13th November 1895.

Order—No. 999 I., dated 21st November 1895.

The following revised estimate is sanctioned in supersession of the estimate of Rs. 4,050, sanctioned in G.O. No. 714 I., dated 17th August 1893 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
North Arcot Division.
Original Works.
Restoring the old Kadaladi tank and its supply channel No. 216 A, of list of Minor Works, Public Works Department.

	RS.
Estimate	4,350

2. This sanction is registered as No. 144 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle, with 37 enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O. No. 999 I., 21st Nov. 1895.

NOVEMBER.

Tank

Revised estimate of Rs. 4,350 for restoring the old Kadaladi — and its supply channel, North Arcot division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 15th October 1895, No. 386 S.E.

With reference to your No. 1080 K.S., dated 15th August 1895, I have the honour to request that an allotment of Rs. 300 may be placed at my disposal for expenditure on Annavaram tank during the current official year.

2. The tank will not be dry enough to commence work until January 1896; hence the full amount of allotment sanctioned by the Board of Revenue has not been applied for.

No. 1531 K.S.

Submitted to the Chief Engineer for Irrigation with reference to his No. II/124 K.S., dated 2nd August 1895.

(Signed) A. S. RUSSELL,
Offg. Suptg. Engineer, II Circle.

18th October 1895.

To the Superintending Engineer, IV Circle, dated 31st October 1895, No. 13 IV.
From the „ IV „ „ 9th November 1895, No. 253 I.

No. 221 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

18th November 1895.

Order—No. 1000 I., dated 21st November 1895.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works, Revenue Department.

From Salem Division.	RS.	*To* Kistna Northern Division.	RS.
Original works	200	Repairs	300
Repairs	100	Establishment	69
	300	Tools and plant	5
Establishment	69		
Tools and plant	5		
Total ...	374	Total ...	374

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" " " IV "
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O. No. 1000 I., 21st Nov. 1895.

NOVEMBER.

Funds

Certain transfers of — for Minor works, Revenue Department, Kistna Northern division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From Lieutenant-Colonel D. McN. CAMPBELL, R.E., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 12th October 1895, No. 2225.

With reference to your memo. No. 31 C., dated 7th May 1895, I have the honour to submit, for your approval and sanction of Government, an estimate amounting to Rs. 20,190, for the construction of an escape across the Pulivagu, Sagiléru upper project. This estimate is in lieu of a syphon costing Rs. 24,300 sanctioned in G.O., No. 10 I. of 9th January 1894. It is requested that the saving of Rs. 4,110 may be added to the balance available for unforeseen works.

2. As it was necessary that the foundations at the deepest part should be completed before the Royacheruvu begins to surplus, orders were issued by my predecessor Mr. Norfor to put the work in hand.

3. In connection with this estimate, I have the honour to bring to your notice that the rates now allowed are far in excess of the sanctioned rates. The reason for this is that the Executive Engineer in his No. 2744, dated 8th February 1895 (copy enclosed), stated that it was impossible in many cases to work to the sanctioned rates and, in support, submitted a detailed data and a comparative statement of rates, with a request that he may be allowed to pay the rates proposed by him in anticipation of sanction.

4. Colonel Rawson, who was Superintending Engineer at the time, gave the Executive Engineer permission to pay the increased rates, and to give further explanation regarding the necessity for the same. After a great deal of correspondence, the Executive Engineer has now finally fixed the rates at which work could be executed. His explanation and a comparative data of rates prepared in this office, with the Executive Engineer's remarks, are herewith submitted for your information.

Enclosures.

From the Executive Engineer, Cuddapah Division, to the Superintending Engineer, III Circle, dated Bellary, 8th February 1895, No. 2744.

I have the honour to inform you that I have found it impossible in many cases to work to the sanctioned rates allowed in the estimates for the Sagiléru project. I think it inadvisable for many reasons to submit revised estimates at present for the various works, the chief one being that it is practically certain that the whole project will have to be revised; but I should like some authority for allowing higher rates than have been sanctioned. I therefore submit a comparative statement of rates and data sheet in support of my rates, which I request you will approve of. The statement is not a complete one, as it only includes those rates for works which have been actually started and have been found insufficient.

I may add that, in anticipation of sanction, I am paying for these works at my rates.

Report to accompany the plan for an escape at Pulivagu.

A syphon has been sanctioned for passing the channel under the Pulivagu, but after inspecting the site, the Superintending Engineer was strongly of opinion that it would be better, the ground level being suitable, to have a long escape in the right bank of the channel and to leave the left side of the channel without a bank and to move the regulator which it was proposed to build at 4¾ miles up to just below the escape. By so doing a very great deal of the water which now runs to waste would be caught and sent down the supply channel.

The estimated cost (revised) of the syphon is nearly Rs. 30,000. The cost of the escape proposed is Rs. 20,190, and there would also be a saving in banking the sides of the channel for the length of the escape (625 feet).

(Signed) S. B. MURRAY,
Executive Engr., Cuddapah Divn.

No. 217 I.

Submitted to Government with a recommendation that the estimate forwarded by the Superintending Engineer, III Circle, be sanctioned.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
15th November 1895. Chief Engineer for Irrigation.

Order—No. 1002 I., dated 21st November 1895.

The following estimate is sanctioned in lieu of the provision of Rs. 24,300 made for a syphon in the estimate sanctioned in G.O. No. 10 I., dated 9th January 1894, the saving of Rs. 4,110 effected by the present estimate being added to the balance available for unforeseen works of the Sagiléru project, which will then be increased to Rs. 4,629 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Sagiléru Project.
Capital Account.
2. Main Canals and Branches.
8. Escapes.
Constructing an escape across the Pulivagu.

	RS.
Estimate	20,190

2. This sanction is registered as No. 143 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, III Circle, with eleven enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O. No. 1002 I., 21st Nov. 1895.

NOVEMBER.

Sagileru Project

Estimate of Rs. 20,190 for constructing an escape across the Pulivagu, —, Cuddapah division, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—again the following paper :—

G.O. No. 798 I., dated 26th September 1895.

Read—also the following papers :—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 8th November 1895, Mis. No. 6028.

Read—G.O., Mis. No. 4265, Revenue, dated 29th October 1895.

Resolution—dated 8th November 1895, Mis. No. 6028.

Communicated to the Collectors of Gódávari and Kistna, who will make the necessary arrangements for the distribution of paddy seed referred to amongst the ryots and afford them every encouragement for extending the cultivation of the three months' crop in the low lands bordering the Colair lake.

2. The advantage of raising a short crop of the kind should be clearly brought home to the ryots, who at present suffer frequent losses owing to submersion by floods of their paddy crops which take a longer time to mature. It should also be published as widely as possible that facilities will be afforded by the Public Works Department in the way of opening canals by the 15th May and closing them only in the beginning of March, so that the canal water may be available for a second crop (the dalwa).

3. The experiment of a second (the dalwa) crop next month (December) should also be arranged for without delay. An Agricultural Inspector will be deputed to assist in supervising and reporting on the results of the experiment.

(True Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

G.O., Mis. No. 4610, Revenue, dated 16th November 1895.

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 13th November 1895, Mis. No. 6098 :—

Read—the following telegram from the Collector of Gódávari, dated 12th November 1895 :—

Proceedings, 6028, Mis., 8th instant. Please order supply paddy seed or inform who will supply. Urgent arrangements must be made.

Resolution—dated 13th November 1895, Mis. No. 6098.

Submitted to Government, Revenue Department, with the request that early orders may be issued in the Public Works Department (Irrigation) regarding the supply of the seed referred to, to the Local Revenue officers.

2. The following telegram will be sent to the Collector of Gódávari :—

"Your telegram 12th. Apply Superintending Engineer for seed."

(True copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

Order—Mis. No. 4610, Revenue, dated 16th November 1895.

Transferred to the Public Works Department for the issue of the necessary orders.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

Order—No. 1003 I., dated 21st November 1895.

Ordered that the following deferred telegram be sent to the Superintending Engineer, II Circle :—

"G.O. 798 I., 26th September last. Expedite purchase and supply of paddy seed for dalwa crop on Colair lands in communication with Collectors Gódávari and Kistna in anticipation of sanction to estimate which submit soon."

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineers, I and II Circles.
" Collectors of Gódávari and Kistna.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O. No. 1003 I., 21st Nov. 1895.

NOVEMBER.

Colair Lake

Ordered that a telegram be sent to the Superintending Engineer, II Circle, directing that the purchase and supply of paddy seed for dalwa crop on lands bordering the — be expedited in anticipation of sanction to estimate.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers:—

Proceedings of the Madras Government, dated 2nd May 1893, No. 1192 W.
From the Engineer-in-Chief, East Coast Railway, dated 22nd Sept. 1893, No. 7084/797.
" Superintending Engineer, I Circle, dated 3rd Oct. 1893, No. 1602 G.D.
To the Engineer-in-Chief, East Coast Railway, " 12th " " " 569 M.
Note by Mr. J. R. Bell, in charge, East Coast Railway, on the proposed bridge crossings of the Gódávari near Rajahmundry.

To the Consulting Engineer for Railways,	dated	9th April 1894,	No.	97.
From the Manager, East Coast Railway,	"	6th Oct. "	"	6114.
To the " "	"	15th " "	"	540 M.
From the " "	"	6th Nov. "	"	6690.
To the " "	"	3rd Dec. "	"	650 M.
From the Superintending Engineer, I Circle,	"	18th Feb. 1895,	"	2162 G.D.
To the " "	"	2nd Mar.	"	21 "
From the " "	"	22nd "	"	2496 "
" " "	"	11th April	"	127 "
Memo. to the " "	"	30th "	"	48 "
From the " "	"	10th July	"	829 "
To the " "	"	25th "	"	73 "

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 8th August 1895, No. 1046 G.D.

In continuation of my No. 829 G.D. of 10th July 1895, I have the honour to inform you that, from the copies of correspondence forwarded with your No. I/73 G.D. of 25th July 1895, and the papers in my own office, I have been able to collect the following information regarding the site for the East Coast Railway bridge across the Gódávari.

2. The site for this bridge, originally selected by Mr. Spring and approved by the Government of India (*vide* papers printed with G.O., No. 450 R. of 18th February 1892), was about five miles above the Gódávari anicut.

3. In September 1893 Mr. Bell, the Engineer-in-Chief, East Coast Railway, in his No. 7084 of 22nd September 1893, to the Chief Engineer for Irrigation, proposed building the bridge about two miles above the anicut.

4. In his No. 569 M., dated 12th October 1893, the Chief Engineer for Irrigation pointed out several very serious objections to this change of site, and Mr. Wybrow, the Superintending Engineer, I Circle, who had also been consulted by Mr. Bell, protested very strongly against having the bridge so near the anicut.

5. In April 1894 the Chief Engineer for Irrigation, in his No. 97, dated 9th April 1894, informed the Consulting Engineer for Railways, Madras, that, after discussing the matter with the Engineer-in-Chief, East Coast Railway, he had no objection to the change of site, but considered that the training banks should first be constructed and their effect on the river noticed for two or three seasons before deciding on a site for the bridge.

6. Permission was also given by the Chief Engineer for Irrigation to build a portion of one of these training banks before commencing the bank on the opposite side of the river.

7. I do not know what arguments were employed by Mr. Bell to make you change your views, but I would respectfully point out that it is quite impossible for any one to predict the effect on the bed of the river which would be produced by the construction of a bridge of the proposed waterway. This was admitted by your predecessor in office, Mr. G. T. Walch—*vide* paragraph 9 of his letter printed with G.O., No. 1192 W. of 2nd May 1893.

8. Mr. Walch, in paragraph 1 of this letter, observed that he would have much preferred the bridge being placed below the anicut, where there could be no possibility of injury to irrigation interests. He therefore admitted the risk of injury even when the bridge was to be built more than five miles from the anicut.

9. This risk becomes very much greater with a bridge only two miles above the anicut; and now that the question has taken its present shape, it becomes very different from the one which had to be decided by Mr. Walch and must be viewed from altogether a different standpoint.

10. Mr. Walch had to decide whether the bridge should be placed five miles above the anicut or below that work, which was equivalent to deciding whether there should be a bridge or a ferry, the cost of building bridges below the anicut having been pronounced prohibitive.

11. Mr. Walch came to the conclusion that there were no reasons for supposing that the construction of the bridge would aggravate shoaling, and considered the risk of injury to irrigation interests was so remote that it might be accepted in consideration of the very great advantages a bridge would have over a ferry.

12. Mr. Bell now asks us to accept a far greater risk, whilst the advantage to be gained is comparatively trifling.

13. The site originally selected for the bridge by Mr. Spring was inspected and approved by the Consulting Engineer for State Railways, and it may be taken for granted that the site is a good one.

14. Possibly the site selected by Mr. Bell is a better one, but to secure this slight advantage of site the enormous interests at stake in the delta have to be imperilled.

15. I venture to assert that, in allowing the bridge to be built even five miles above the anicut, a very grave responsibility has been accepted, and I must emphatically protest against the construction of the bridge at the site proposed by Mr. Bell.

16. The original site for the bridge was approved by the Government of India and by the Government of Madras, and I request that the site may not be changed without the express sanction of Government.

17. With regard to your proposal to construct the training banks first and see what effect they have on the river for two or three seasons before deciding on building the bridge, I have the honour to point out that, when a similar proposal was made by the Honourable Mr. Garstin, it was negatived by Government on the recommendation of Mr. Walch (*vide* paragraph 12 of his letter referred to above) who also pointed out the danger of allowing a huge groyne to be built out into the river.

18. This is what the Manager, East Coast Railway, now proposes doing with your permission, and I have already entered my protest against the work.

No. 181 I.

Note by the Chief Engineer for Irrigation.

After having had the opportunity of a personal consultation with the Engineer-in-Chief, East Coast Railway, in connection with the proposal made by him for carrying out certain works in the Gódávari connected with the ultimate bridging of that river, the undersigned saw no objection to the scheme brought forward for bridging the

river at its normal throat or deep water channel, but suggested that, prior to venturing upon the more expensive part of the scheme in the construction of the bridge itself, the embankments which are to connect the bridge with river banks should be constructed and the effects which they may have upon the river in flood watched and carefully noted for two or three seasons so that, if no results prejudicial to the regimé of the river below the bridge or to the safety of the anicuts or the supply to the several deltas supervene, the construction of the bridge may be proceeded with, for, in dealing with a river like the Gódávari, tentative measures should first be adopted before anything definite can be decided upon.

2. In this office letter No. 650 M., dated 3rd December 1894, to the Manager, East Coast Railway, it was stated that there was no objection to that portion of the training bund of the Gódávari river, as shown in red in the drawing returned by the Superintending Engineer, I Circle, with his letter No. 2496 G.D., dated 22nd March 1895, being constructed first.

3. As the arguments brought forward by Mr. Bell in his note outweigh the objections referred to in Proceedings, Madras Government, No. 1192 W., dated 2nd May 1893, and again by the Superintending Engineer, I Circle, in his letter, No. 1046 G.D., dated 8th August 1895, against altering the bridge site originally proposed by Mr. Spring, it is suggested that the action taken in the matter by this office may be approved.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

12th September 1895.

Order—No. 1014 I., dated 23rd November 1895.

In the circumstances stated, the action taken by the Chief Engineer for Irrigation, regarding the proposed site for the Gódávari bridge, is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Consulting Engineer for Railways.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 23rd.

Recd. *Encl.*

G.O. No. 1014 I., 23rd Nov. 1895.

NOVEMBER.

Godavari Bridge

The action taken by the Chief Engineer for Irrigation regarding the proposed site for the —, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 26th October 1895, No. 733 G.N.

I have the honour to submit herewith, for your approval and sanction of Government, copy of modification statement received from the Executive Engineer, Rushikulya Division, surrendering Rs. 61,577 from the existing grant of Rs. 2,46,577 under "35. Construction of Protective Irrigation Works—Famine Relief and Insurance—Rushikulya Project."

2. The surrender is due to the stoppage of work at the Suradá reservoir dam as explained by the Executive Engineer in the column of remarks of the statement.

3. The Executive Engineer has been requested to send a statement showing details of works on which the surrender has been made, which will be submitted when received.

Enclosure.

Statement showing the modifications of allotments for 1895-96, Rushikulya Division.

Item number.	Main and sub-heads.	Works.	Existing grant.	Modifications. Increase.	Modifications. Decrease.	Net allotment.	Remarks.
		Imperial. *Major (Protective) Works.* Famine Relief and Insurance. 35. Construction of Protective Irrigation Works. Rushikulya Project Capital Account.	RS.		RS.	RS.	
..	..	1. Works	2,46,577	*Nil.*	61,577	1,85,000	1. *Works.*—The surrender is due to the cessation of work at Suradá reservoir dam practically since June 1895, and large savings on Gullery and Russellkonda reservoir dam works which have been completed.
..	..	2. Establishment	51,423	*Nil.*	14,163	37,260	2. *Establishment.* — Corresponding reduction of centage on account of establishment.
..	..	3. Tools and plant	2,000	*Nil.*	2,000	*Nil.*	3. *Tools and plant.*—There is a credit under this head owing to transfer of surplus machinery, &c., to other divisions.
		Total ..	3,00,000	*Nil.*	77,740	2,22,260	

No. 1660.

Forwarded to the Superintending Engineer, I Circle, with reference to his No. 461 G.L., dated 4th October 1895.

(Signed) W. C. DeMORGAN,
Executive Engineer.

ORDER—No. 1020 I., dated 25th November 1895.

The sum of Rs. 77,740 surrendered from the current year's grant for the Rushikulya Project under "35. Protective Irrigation Works" will be relinquished to the Government of India.

2. The following deferred telegram will be sent to the Government of India:—

"Please accept surrender Rs. 77,740 under 35. Rushikulya Project owing to temporary cessation of work at Suradá reservoir dam and large savings on completed works."

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1021 I., dated 25th November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle.
,, Examiner, Public Works Accounts.

ENDORSEMENT—No. 1021 I., dated 25th November 1895.

Forwarded.

(By order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 25th.

Recd. *Encl.*

G.O. Nos. 1020, 1021 I., 25th Nov. 1895.

NOVEMBER.

Funds

Forwarding Proceedings relinquishing a sum of Rs. 77,740 from the current year's grant for the Rushikulya Project under "35. Protective Irrigation Works."

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From Lieutenant-Colonel C. C. Rawson, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 9th August 1895, No. 240 E.I.

With reference to paragraph 35, Chapter V, Volume II of the Code, I have the honour to submit, for sanction and allotment of funds under the open Capital account, the enclosed estimate of Rs. 1,910, with accompaniments as per margin, for improving Vadakarai Kohoor channel, branching from Thirumalarajanar left bank, mile 64, in Kumbakónam taluk of the Tanjore division.

1 Survey.
2 Sheets of levels.
1 Report
1 Estimate.
—
5
—

2. The necessity for the proposed work is explained in the report attached to the estimate.

3. If the estimate is sanctioned and funds are allotted at an early date, the work can be completed by 31st March 1896.

4. The work is considered remunerative.

Enclosure.

Report to accompany the estimate for improving Vadakarai Kohoor channel, Thirumalarajanar left bank, 64th mile.

	RS.
Amount of estimate	1,620

Vadakarai Kohoor channel from its head *B** down to *C* (nearly 1½ miles) lies in the river "padugai." At *C* it crosses the river bank and thence goes off to the fields. Thirumalarajanar being, at that reach and below, mainly a drain, several bends exist and very many bad erosions form from time to time; as such, irrigation channels lying in the "padugai," that is, between the river margin and its bank, are, in almost all cases, subject to risks of breaching into the river and losing themselves into it, wherever the "padugai" is narrow. In this channel, as a result of the river erosion, a portion of it at *D* has been encroached on by the river, practically rendering the portion of channel above it useless. The river bed at *D* is too low for the lands; a head to the channel at *D* will not suit its irrigation in consequence. So the head at *B* has to be maintained.

* Please see survey plan.

2. The channel down to *C* being in the "padugai" and there being no sluice at *C* where it crosses the river bank, its portion between *B* and *C* is very much silted and the villagers have been getting no water at all for the last some years. They have been granted frequent remissions of revenue. The kudis concerned have been complaining all along and the Revenue Department has been constantly pressing the matter to the urgent attention of the Public Works Department. Measures have at once to be adopted to improve the channel and arrange for giving water to the suffering lands and relieve the unfortunate kudis.

3. The exposed length of the channel between its head and the present bank-crossing is 7,600 feet. For the safety of the channel we have to push up the bank-crossing point as far near the channel's head as possible; or in other words, we have to make the leading channel surplus as short in length as possible. Accommodating the small Kottangudi channel surplus that joins the present leading channel, securing at the same time to the high lands the fullest advantage of having the channel's offtaking point as high up as possible on the river, and without making the cost of the work unnecessarily too heavy, it is proposed to retain the head at *B* and make the leading channel cross the river bank at *A*, 3,000 feet below *B*, and construct there a proper head sluice to it to exclude the river floods.

4. Even the then remaining 3,000 feet length of leading channel is too long, and with the sluice only at *A*, the accumulation of silt in *BA* would be considerable. Leaving the very high floods to spread over the "padugai" and fill the channel depositing, if at all, a little silt in it in *BA*, it is considered desirable to put a cheap sluice at *B*, to prevent the influx of sand and silt in ordinary freshes and floods. The plan of the proposed cheap silt sluice is shown on the survey plan.

5. From *A* the channel is proposed to be taken on the left side of the river bank, which necessitates the excavation of two bits of new channels—one from a little above *A* to *E* 2,750 feet long, and the other from *F* to *C* 800 feet long (the portion *EF* being existing channel)—and a diversion to the right of channel of the river bank from *E* to *F*, for all of which due provision is made in the accompanying plans and estimate.

6. The excavation of the two bits of new channels requires lands to be taken up, for which a lump sum provision of Rs. 300 is made for compensation, on an approximate calculation of 300 "gulies" required at Re. 1 a "guly." The spoil from the cutting is proposed to be utilized in repairing the bank in the vicinity, the river bank here being allowed to be raised and strengthened to the necessary extent.

7. The hydraulic calculations for the channel and the sluices are shown in ample detail on the accompanying plans and level sections.

8. The above improvements are absolutely necessary for the efficient irrigation of the 196 acres of Vadakarai Kohoor village, which have been very badly off for the last ten years and more.

9. *Specification.*—Work will be done according to the standard specification.

(Signed) T. RAGHAVA CHARI,
Assistant Engineer.

29th June 1895.

The alterations as ordered by the Chief Engineer for Irrigation have been made. A scouring sluice above the head sluice has however been added in order to scour out the leading channel. The head sluice will be provided with Colonel Drake-Brockman's shutters or some modification of them.

(Signed) J. JOHNSTON,
Executive Engineer.

24th September 1895.

To the Superintending Engineer, V Circle, dated 22nd August 1895, No. 44 T.J.
From ,, ,, ,, ,, 2nd October ,, ,, 300 E.I.

No. 222 I.

Submitted to Government. The amount of the estimate has been reduced in this office from Rs. 1,850 to Rs. 1,620 by the elimination of the provision made therein for the proposed scouring sluice which is not very necessary.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

18th November 1895.

ORDER—No. 1022 I., dated 26th November 1895.

The following estimate is sanctioned :—

Capital expenditure not charged to Revenue.
49. Irrigation.
Cauvery Delta System.
Open Capital Account.
3. Distributaries.
Remunerative Work.
Improving Vadakarai Kohoor channel, Thirumalarajanar left bank, 64th mile.

		RS.
2. Land ...	... ...	300
3. Works	... ...	1,320
	Total I. Works	1,620
	II. Establishment ...	304
	III. Tools and plant ...	6
	Total estimate ...	1,930

2. This sanction is registered as No. 146 I. of 1895–96 and will expire on the 31st March 1897.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1023 I., dated 26th November 1895.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle, with six enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

ENDORSEMENT—No. 1023 I., dated 26th November 1895.

Forwarded.

(By order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O. Nos. 1022, 1023 I., 26th November 1895.

NOVEMBER.

Cauvery Delta System

Forwarding Proceedings sanctioning an estimate of Rs. 1,930 for improving Vadakarai Kohoor channel, Thirumalarajanar left bank, 64th mile.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 23rd October 1895, No. 732 G.N.

I have the honour to submit herewith, for sanction, plans and estimates amounting to Rs. 6,290, received from the Executive Engineer, Rushikulya Division, for the works connected with No. 1 Distributary from $1\frac{7}{8}$ miles, Mahanadi canal, as per enclosed classified abstract.

2. It is estimated that 3,200 acres will be irrigated by the channel as explained in the report accompanying the estimate.

3. Out of the estimate amount of Rs. 6,290, Rs. 5,070 will be met from the lump sum provision of Rs. 9,500 for irrigation channels and Rs. 1,220 from the lump sum of Rs. 2,000 for Minor works (*vide* items 271 and 272, respectively, of the comparative statement printed with G.O. No. 13 I., dated 10th January 1894).

ENCLOSURES.

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	FAMINE RELIEF AND INSURANCE.	RS.	RS.	RS.	
	35. *Construction of P. I. Works.*				
	Rushikulya Project.				
	Rushikulya Division.				
	Mahanadi Canal.				
	3. Distributaries.				
	Distributary No. 1 from $1\frac{7}{8}$ miles of Mahanadi Canal (first 5 miles).				
1. Preliminary expenses.	1. Preliminary expenses	100	100		
3. Works ..	2. Drop No. 1 at $\frac{15}{16}$ mile	220			
	3. Drop No. 2 at $2\frac{1}{2}$ miles	240			
	4. Carrying pipes across No. 1, River Irrigation Channel at $3\frac{9}{16}$ miles + 75 feet	350			
	5. Drop No. 3 at $3\frac{5}{8}$ miles	210			
	6. Carrying pipes across No. 2, River Irrigation Channel at $4\frac{3}{4}$ miles	200	1,220		
4. Earthwork.	7. Excavation of channel	4,720	4,720		
5. Miscellaneous.	8. Fixing demarcation stones	250	250		
	Total estimate ..			6,290	

Note.—Items 1, 7 and 8 are to be met from the lump sum provision of Rs. 9,500 made in G.O. No. 13 I., dated 10th January 1894, for Irrigation channels (*vide* item 271 of the comparative statement). Items 2 to 6 are to be met from the sum, against item 272 of the comparative statement.

(Signed) W. DEMORGAN,
Executive Engineer, Rushikulya Divn.

RUSHIKULYA,
28th September 1895.

REPORT to accompany plans and estimates for No. 1 Distributary, Mahanadi Canal.

The distributary takes off at $1\frac{7}{8}$ miles, left bank of Mahanadi canal. An estimate for the head sluice has already been sanctioned.

2. It runs parallel to the right bank of the Kaliamba nala up to the point where the nala falls into the Mahanadi river, and beyond that parallel to the right flood bank of the river. It will irrigate 3,200 acres.

3. In places the right flood bank of the river can be utilized as a channel bank. In other places where the channel passes round villages, or where the flood bank is much eroded, double banks are required. The arrangements are shown on the longitudinal section.

4. Two river channels are crossed at miles $3\frac{9}{16}$ + 75 feet, and miles $4\frac{3}{8}$. These channels are provided with sluices. It is proposed to carry the distributary across the channels by means of earthenware pipes, resting on iron rails driven into the rear faces of the sluices. The river channels will thus remain available for supplemental irrigation. Subsequently, the sluices will be provided with regulating gear.

5. The cost per acre irrigated—

	RS.
Earthwork	1·47
Masonry	0·49
Cost per mile—	
Earthwork	944
Masonry	314

The channel may subsequently be extended.

6. Land plans and schedules have been submitted to the Special Deputy Collector who is now acquiring the land. As soon as land is handed over, it is proposed to start work in anticipation of sanction.

7. Rupees 2,000 only are provided for masonry works on Minor distributaries, Mahanadi canal (*vide* item 272 of re-revised estimate).

* * * * *

29th September 1895.

(Signed) W. DEMORGAN,
Executive Engineer, Rushikulya Divn.

ORDER—No. 1024 I., dated 26th November 1895.

The estimates aggregating Rs. 6,290 for distributary No. 1 from $1\frac{7}{8}$ miles, Mahanadi canal, Rushikulya project, are sanctioned, the proposed outlay on items 1, 7 and 8 and on items 2 to 6 of the classified abstract estimate being met from the provision made for items 271 and 272, respectively, of the comparative statement printed in Proceedings of Madras Government, No. 13 I., dated 16th January 1894.

2. This sanction is registered as No. 145 I. of 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle, with eighteen enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 26*th*.

Recd. *Encl.*

G.O. No. 1024 I., 26th Nov. 1895.

NOVEMBER.

Rushikulya Project

Estimates aggregating Rs. 6,290 for distributary No. 1 from $1\frac{7}{8}$ miles, Mahanadi canal, —, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

From the Superintending Engineer, I Circle, dated 20th June 1895, No. 221 V.Z.
To the " " I " " 25th " " " 19 V.Z.

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 26th October 1895, No. 538 V.Z.

With reference to your memo. No. I/19 V.Z., dated 28th June 1895, I have the honour to resubmit, for the sanction of Government, the plan and estimate, amounting to Rs. 3,800, for a sluice which the Darlapudi proprietor wishes us to build above the Koppaka anicut.

2. With reference to paragraph 2 of your memorandum I beg to report that the Collector of Vizagapatam district in his letter No. 4345, dated 25th September 1895 (copy enclosed), states that the Government and the Darlapudi proprietor are the only parties interested in the construction of the sluice, and that he has no objection to its construction with a vent of 4′ × 5′ at the cost of the Darlapudi proprietor and under the supervision of the Public Works Department (*vide* report accompanying the estimate).

3. The plan has been altered in accordance with the instructions contained in paragraphs 3 and 4 of your memorandum under reply.

ENCLOSURES.

From the Collector of Vizagapatam District, to the Superintending Engineer, I Circle, dated 25th September 1895, No. 4345.

Referring to your No. 389 V.Z., dated 25th August 1895, I have the honour to state that, so far as I can see, Rajah Gajapati Row and the Government are the only parties interested in the construction of the head sluice referred to. I have no objection to its construction with a vent of 4′ × 5′ on the following three conditions:—

(1) The Rajah should pay one-third of the cost of the recent extension and rebuilding of the anicut.
(2) The Rajah should pay one-third of the cost of the annual repairs to the anicut.
(3) The Rajah should not interfere with, nor object to, the opening of the scouring sluices in the body wall of the anicut by Government whenever it thinks proper.

The Rajah has agreed to the above three conditions in his letter to me, dated 4th October 1894, copy of which is herewith forwarded for your information. I therefore request that the sanction of Government may be obtained for the construction of the sluice with a vent of 4′ × 5′ under the above three conditions at an early date.

REPORT to accompany the estimate for the construction of a head sluice to Darlapudi channel above Koppaka anicut in the Varaha river right bank.

	RS.
Amount of estimate	3,800

The lands of the Darlapudi proprietor are at present supplied by a vent in the Koppaka anicut, measuring 4 feet in height and 2 in width. The water passing through this vent is carried by a channel which runs for some distance along the river-bed below the anicut. The upkeep of this portion of the channel is, as may be supposed, very expensive in consequence of the bund between it and the river constantly breaching, and in his inspection notes for December 1892 Mr. Wybrow pointed out that the Darlapudi proprietor would be saved a lot of trouble and expense if he obtained his supply from a sluice to be built above the anicut so that he could dispense with that portion of his channel in the river-bed.

2. As the Darlapudi proprietor is entitled to a third share of water in the Koppaka anicut, a vent 4 feet in breadth and 5 feet in height is allowed (in proportion to the area of the sluice with two vents 4′ × 5′ each, which the Government has built to allow two-third share for the benefit of the ryots of Puliparti) on the following three conditions:—

(i) The Darlapudi preprietor should pay one-third of the cost of the recent extension and rebuilding of the anicut.

(ii) The proprietor should pay one-third of the cost of the annual repairs to the anicut.

(iii) The proprietor should not interfere with, nor object to, the opening of the scouring sluices in the body wall of the anicut by Government whenever it thinks proper.

3. The Collector of Vizagapatam district in its letter No. 4345, dated 25th September 1895, states that he has no objection to the construction of the head sluice with a vent of 4′ × 5′ as the Government and the Darlapudi proprietor are the only parties interested in the affair.

4. The work will be carried out under the supervision of the Public Works Department at the expense of the Darlapudi proprietor.

5. The different descriptions of the works provided in the estimate will be carried out in strict accordance with the standard specification of the Public Works Department.

(Signed) A. H. GARRETT,
Superintending Engineer, I Circle.

26th October 1895.

No. 224 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

18th Nov. 1895.

ORDER—No. 1025 I., dated 26th November 1895.

The execution by the Public Works Department of the work "constructing a head sluice to Darlapudi channel" at an estimated cost of Rs. 3,800, inclusive of the percentage charges for establishment and tools and plant, is sanctioned. The work should be put in hand only when the Rajah has paid into the treasury the cost of the sluice and his contribution for the extension of the anicut in accordance with the foregoing letter from the Collector of Vizagapatam.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle, with three enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.

Govt. of {1895} Madras

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O. No. 1025 I., 26th Nov. 1895.

NOVEMBER.

Sluice

The execution by the Public Works Department of the work "constructing a head — to Darlapudi channel," Vizagapatam district, at an estimated cost of Rupees 3,800, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

From W. B. DEWINTON, Esq., Executive Engineer, Coimbatore Division, to the Superintending Engineer, IV Circle, dated Coimbatore, 24th July 1895, No. 2914.

I have the honour to report that, in accordance with the instructions contained in G.O. No. 322 I., dated 5th April 1895, forwarded with your No. 242 C.I., dated 25th April 1895, I have accepted a tender for the construction of the head sluices to Kullapuram and Krishna Iyer's channels, and I visited the spot on 27th June for the purpose of inspecting the site of the sluices and giving instructions for the commencement of the work.

2. I have since also inspected a large number of the anicuts and channels on the Amarávati, and I have come to the conclusion that, in the present state of the irrigation under that river, we are making a great mistake if we build head sluices to any of the channels receiving their supply from it.

3. Of course, I have seen the river under exceptionally favourable circumstances, with a good supply of water flowing down it, but the impression left on my mind is that these anicuts do the work required of them (viz., turning a portion of the river water down the channels and passing more down the river) in a very admirable manner, and that we are likely to do a great deal more harm than good if we interfere with them in any way, or do anything more than maintain the *statu quo* which has existed for so many years.

4. And with regard to the channels, which are one week flowing full and the next have a very scanty supply, how is it possible to regulate with advantage the supply down them by means of head sluices which will only pass a certain number of cubic feet per second, as if we had the constant and uniform supply of water available in the Gódávari? The channels are essentially flood channels, *i.e.*, the lands under them get a copious supply during flood times, which saturates them and fertilizes them, and enables them to tide over the days of scanty supply which invariably follow. If we build head sluices we check this much-needed flood supply, of which the surplus finds its way back into the river, we do harm to every acre under the river, and we do good to no one, for at such times there is ample water for every one; while in seasons of scarcity the head sluice does no good, for each channel wants every drop it can get and the anicut does the regulation by passing water down the river through leaks.

5. Nor will the construction of head sluices increase the area of irrigation, for every acre between the channels and the river is now cultivated; and the way to ensure each one of these acres getting its proper supply is to build new distribution sluices not head sluices.

6. I therefore maintain that so long as the present conditions exist, *i.e.*, so long as we do not store Amarávati water, or know what amount of water we have to deal with (of which we are at present absolutely ignorant), it is not only impolitic but impossible to attempt to regulate the supply by scientific methods, and the attempt to do so will injure Government revenue and land us in endless disputes and law suits.

7. There are only two ways, it seems to me, of improving and increasing irrigation under the Amarávati—

(1) By storing water in a reservoir near Kullapuram as already proposed by you.

(2) By resluicing all the channels and abolishing all open cuts and interference of ryots with the channel banks and sluices, and so giving the ryots at end of channels, where alone are there now complaints of scarcity, their fair share of water.

8. And now with regard to the two sluices with which this letter is principally concerned, if you agree with the remarks above made, I beg that you will be good enough to move Government to reconsider the decision arrived at in G.O. No. 411 I. of 23rd May 1894, and cancel the construction of the sluices. I think I may say with absolute certainty that no one will benefit by their construction. Government will not, because the sluices will curtail the flood supply on which the lands under these channels mainly depend, and remissions will be the certain result. The Kullapuram ryots will not, because they already get a greater proportion of water as compared with Krishna Iyer's channel than they are entitled to, as the following figures based on observations made by me on the day of inspection will show:—

	Kullapuram channel.	Krishna Iyer's channel.
Ayacut	1,400 acres.	1,569 acres.
Waterspread in channel	23′	16′ 10″
Mean velocity	1·56 per second.	1·38 per second.

I intended to compare the discharge of the two channels, but my levels were unfortunately vitiated by the slipping of a levelling staff. The discharge of Kullapuram channel was however undoubtedly much greater than that of Krishna Iyer's channel. Neither will Krishna Iyer benefit: he is certainly not getting more than his fair share of water at present and interference with his present supply will only lead to litigation.

The Kullapuram ryots do not want a head sluice any more than Krishna Iyer does. What they do want is new distribution sluices, and these should be given them as soon as possible.

9. I must apologise for the length of this letter, but the subject is a very interesting one, and I am most anxious to see all interference with Amarávati irrigation, in what I firmly believe to be the wrong direction, stopped, and a beginning made with what I am sure you will agree with me to be the two main requirements of this very important source of revenue, viz., storage of water and resluicing of channels. I also think that when all the channels are resluiced they should be placed under the control of this department.

This I do not subscribe to. The regulation can be better looked after by the Revenue Department.

(Sd.) J. Hannan.

10. It is impossible for us to commence the construction of these sluices until after the irrigation season, *i.e.*, in January or February next; so there is ample time for a reconsideration of the matter.

No. 156/E.I.

Copy forwarded to the Chief Engineer for Irrigation for the orders of Government with reference to paragraph 8.

2. The undersigned has over and over again expressed the same views which have now been arrived at independently by Mr. DeWinton.

(Signed) J. HANNAN,
Suptg. Engineer, IV Circle.

30th July 1895.

To the Superintending Engineer, IV Circle, dated 9th Aug. 1895, No. IV/42-C.I.
From the " IV " " 11th Sept. " " 195 I.
To the " IV " " 23rd " " " IV/53-C.I.
From the " IV " " 1st Oct. " " 213 I.
Petition from K. Venkata Krishnia, ryot of Komaralingam village, Udamalpet taluk, Coimbatore district, dated 18th September 1895.
From the Superintending Engineer, IV Circle, dated 8th November 1895, No. 249 I.

No. 223 I.

Submitted to Government.

2. In the circumstances brought to notice, it is recommended that the sanction accorded in G.O. No. 322 I., dated 5th April 1895, for the construction of the head sluices be cancelled.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

18th November 1895.

ORDER—No. 1026 I., dated 26th November 1895.

Approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, IV Circle.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1895} Madras

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O. No. 1026 I., 26th Nov. 1895.

NOVEMBER.

Sluices

The recommendation of the Chief Engineer for Irrigation that the sanction accorded in G.O. No. 322 I., dated 5th April 1895, to the construction of head — for Kullapuram and Krishna Aiyar's channels, Coimbatore division, be cancelled, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From N. F. MACKENZIE, Esq., Under Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Simla, the 5th November 1895, No. 270 I.

I am directed to acknowledge the receipt of the Proceedings of the Government of Madras, No. 698 I., dated the 29th August 1895, copy forwarded under your No. 699 I. of the same date, containing completion report on the closing of the construction estimate of the Sangam anicut project.

2. With reference thereto, I am to convey the following remarks :—

(i) In the statement on page 5 of the Completion Report showing the financial results of the project, the *net* revenue due to old irrigation has been deducted from the receipts instead of deducting the gross revenue due to old irrigation from the receipts and the old maintenance charges from the expenditure side. Though the final results have not been affected, the effect of the erroneous method adopted by the Local Government is that the revenue due to improvements during and up to end of 1893–94 has been shown at Rs. 25,000 and Rs. 1,77,428, respectively, more than the correct figures.

(ii) Again in the statement on page 8, the net revenue due to old irrigation is added to the actual working expenses. This is incorrect. The gross revenue due to old irrigation should have been deducted from the revenue, and the old maintenance charges from the working expenses. The actual receipts and charges arrived at by this process will compare well with the estimated figures, which do not apparently include the old revenue and expenditure.

I am to ask that these errors may be rectified and the statements revised accordingly.

(iii) The result of the operations of the project to end of 1893–94 is as shown below :—

	RS.
Capital Outlay—	
Direct	30,66,962
Indirect	6,85,032
Total ...	37,51,994
Revenue Account—	
Gross revenue	8,96,406
Working expenses	3,96,727
Net revenue ...	4,99,679
Deduct—	
Interest charges	11,50,433
Balance of Interest ...	6,50,754
Sum at charge ...	44,02,748
Net revenue during 1893–94	1,23,018
Percentage of net revenue in 1893–94 on the sum at charge ...	2·79

The above figures show that the Sangam anicut project has not yet fulfilled the conditions of a productive public work. It is not stated whether the ultimate revenue will cover the interest charges on the sum at charge, and until this is known, the Government of India are unable to decide whether the further capital outlay on the project should be debited to the grant under 49 or to that under 43—*vide* rules contained in Public Works Department Code, Volume II, chapter V, paragraph 35 (viii). I am therefore to ask that the Government of India may be favoured with information on this point.

3. I am to add that the completion report should be revised in accordance with the foregoing remarks and submitted to the Government of India at as early a date as practicable.

4. To regularize the further expenditure on the project, I am to communicate the sanction of the Government of India to the unspent balance of the schedule of incomplete works on page 7 of the Completion Report, amounting to Rs. 45,605, as detailed below, omitting therefrom the last two items which were sanctioned by the Government of Madras in 1894-95 and which should not have been included in the schedule of works :—

	RS.
Works (omitting the last two items)	39,402
Establishment on above *less* land charges	6,203
Total ...	45,605

5. The sanction accorded in paragraph 4 of this letter has been registered as No. 20 I. of 1895-96.

ORDER—No. 1027 I., dated 26th November 1895.

Communicated to the officers concerned with reference to G.O. No. 698 I., dated 29th August 1895.

2. The Chief Engineer for Irrigation will submit, as soon as possible, a revised completion report for the Sangam anicut system with the information required by the Government of India to decide the incidence of the further capital outlay thereon.

3. The sanction accorded by the Government of India in paragraph 4 of the foregoing letter is registered as No. 148 I. of 1895-96.

	RS.
Gogulapalli branch channel, minor sluice, 2 miles 1,050 feet, right bank	270
Gogulapalli regulator and sluice, 2 miles 1,320 feet ..	530
Total, I. Works ..	800
II. Establishment ..	184
Total ..	984

Sanction to expire on 31st March 1896.

4. The estimates sanctioned for the works marginally-noted will be treated as having been sanctioned under "Open Capital Account" of the Sangam anicut system.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O. No. 1027 I., 26th Nov. 1895.

NOVEMBER.

Sangam Anicut Project

Letter from the Government of India requesting that a revised completion report for the — be submitted early, and sanctioning the schedule of incomplete works, amounting to Rs. 45,605, to regularize the further expenditure on the project, communicated to officers concerned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From	the Superintending	Engineer,	V Circle,	dated	16th June	1894,	No.	227 E.I.
To	„	„	„	„	22nd „	„	„	41 S.A.
From	„	„	„	„	30th July	„	„	289 E.I.
To	„	„	„	„	20th Aug.	„	„	50 S.A.
From	„	„	„	„	12th Oct.	1895,	„	314 E.I.
To	„	„	„	„	18th „	„	„	59 S.A.

From Lieutenant-Colonel C. C. RAWSON, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 29th October 1895, No. 338 E.I.

With reference to your No. V./59 S.A., dated 18th October 1895, I have the honour to submit, for sanction, enclosed revised plan and estimate of Rs. 2,100, for constructing sluice vents in No. 1 weir of Wallajah tank of the Shatiatope anicut system, South Arcot division, prepared on the lines indicated in your memorandum No. V./50 S.A., dated 20th August 1894.

2. Part only of the revenue particulars called for in paragraph 3 of your memorandum No. 50 S.A., dated 20th August 1894, was received from the Executive Engineer, South Arcot Division, in last month, the rest were received in this month. The Executive Engineer states that the delay was owing to this information not having been received from the Revenue authorities.

ENCLOSURE.

REPORT to accompany estimate for providing weir No. 1, Shatiatope anicut system, with shuttered vents.

The Vellaur Rajah voikal, the main channel from the Shatiatope anicut system, has little or no fall throughout its length.

It feeds the Wallajah and Perumal tanks which irrigate, respectively, 10,580 and 6,776 acres; in addition to this, the channel irrigates 1,800 acres directly through sluices in its right bank before it enters the Wallajah tank.

2. The levels are as follows :—

Crest of Shatiatope anicut	+	38·71
Sill of Rajah voikal head sluice (three vents 6′ 4″ × 4′ 6″) ...	+	34·28
Crest of Wallajah tank weir	+	38·70
Sill of Perumal tank supply sluice (two vents 2′ × 3′) in Wallajah tank	+	34·00

3. From the above valves of masonry works it will be seen that with water at crest level of anicut, the discharge from Wallajah tank weir is *nil* and if, owing to local rainfall, the tank discharges, the Rajah voikal flows back towards the river.

4. The fall from sill of Rajah voikal head sluice to Perumal supply sluice is only + 0·28 in six miles; if allowance be made for the fact that the Perumal sluice is at the far end of the Wallajah tank, the fall may be considered to be *nil*.

5. The Perumal tank can, under existing conditions, only get a good supply when the Vellaur is in high fresh, and at these times the supply down the main channel has to be regulated, to avoid breaching of its right bank.

6. The arrangement at present in vogue is this, viz.: when the first freshes come down the Vellaur, the direct irrigation sluices in the main channel right bank are closed, as also are all the Wallajah tank sluices, and this closure is maintained for the period of one month during which water is forced down to and through the Perumal supply sluice; the supply thus given to the Perumal tank is not very abundant, and it is clearly provided at the expense of all the other cultivation under the system.

7. The Perumal tank is a shallow one and must fill several times to irrigate the 6,000 acres under it; under existing arrangements it cannot get the requisite number of fillings from the main channel, it therefore has to depend to a great extent on local rainfall and the drainage supply resulting therefrom. In every year of scanty or even moderate rainfall there is much complaint from the Perumal ryots.

8. These facts were brought to the notice of the Chief Engineer for Irrigation when he visited Shatiatope anicut in January last; he suggested that one of the Wallajah tank weirs be cut down and provided with shutters, with a view to letting this tank surplus at an earlier date.

9. In working out this scheme it was recognized that, while benefiting Perumal tank, it might lead to loss of water in Wallajah; the shutters having once been lowered could only be replaced as water fell; that is, they could only be replaced when the river had fallen below anicut crest, the tank F.T.L. and anicut crest being at the same level.

10. It was then decided by me to extend the suggestion of the Chief Engineer and provide three vents in the body wall of weir No. 1, placing sill of these vents at + 32·70 or 1·58 feet lower than the sill of main channel head sluice; the water way of each vent to be 6′ × 3′, the shutters being worked from a platform which is in a level with the crest of weir.

11. The plan and estimate now submitted have been worked out on these lines under my instructions, the cost being Rs. 2,100.

The advantages which will result from this work are—

(1) The insurance of a fair supply to Perumal tank whenever there are freshes in Vellaur, this supply being provided without detriment, as is now the case, to other cultivation under the system.

(2) The capability of passing off local drainage without necessarily letting it flow back up the Rajah voikal, thus to a great extent minimizing the danger of breaches in this channel.

(3) Giving the main channel a fall throughout its length, thus preventing much silting which at present results from the flowing back of the channel, and thereby reducing the cost of the clearance now periodically necessary.

12. The carrying out of the proposal would, it is considered, improve the working of the system and would be money well spent.

(Signed) J. P. DAVIDSON,
Executive Engineer.

5th April 1894.

No. 225 I.

Submitted to Government.

2. At present it is difficult to pass on a supply to Perumal tank from the Shatiatope anicut as the sill of the supply sluice is only 5 feet below F.T.L. The sill of the proposed sluices will be 9 feet below F.T.L. and the estimated discharge will be sufficient to fill the Perumal tank in about twelve days.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

21st Nov. 1895.

ORDER—No. 1028 I., dated 26th November 1895.

The following estimate is sanctioned:—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Shatiatope Anicut System.
Open Capital Account.
2. Main Canals and Branches.
4. Falls and Weirs.
Unremunerative work.
Constructing sluice vents in No. 1 weir of Wallajah tank.

	RS.
I. Works	2,100
II. Establishment	483
III. Tools and plant	7
Total estimate ...	2,590

2. This sanction is registered as No. 147 I. of 1895–96 and will expire on the 31st March 1897.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle, with five enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O. No. 1028 I., 26th Nov. 1895.

NOVEMBER.

Sluice Vents

Estimate of Rs. 2,590 for constructing — in No. 1 weir of Wallajah tank, Shatiatope anicut system, South Arcot division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 8th November 1895, No. 1810 G.D.

I have the honour to request that you will be good enough to obtain sanction of Government to maintain a parmanent reserve stock of Rs. 1,500 in the Gódávari Central division under paragraph 125, chapter II, Volume II, of the Public Works Code.

2. The stock will consist mainly of building stone, revetment stone and broken stone (for concrete), together with some lime, &c.

3. It is especially necessary to keep a sufficient reserve in this division, owing to its inaccessibility for fully laden boats during nearly the whole working season, and often for any kind of boat during the latter part of the working season.

4. The limit now proposed (Rs. 1,500) is the same as that sanctioned in G.O. No. 432 I., dated 22nd July 1887, for the late Gódávari Central division abolished in March 1890.

Order—No. 1029 I., dated 27th November 1895.

The maintenance in the Gódávari Central division of a reserve stock not exceeding Rs. 1,500 in value is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 27th.

Recd. *Encl.*

G.O. No. 1029 I., 27th Nov. 1895.

NOVEMBER.

Reserve Stock

The maintenance in the Gódávari Central division of a — not exceeding Rs. 1,500 in value, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

To the Superintending Engineer, IV Circle, dated 7th July 1893, No. 2541 C.
" " " " " 27th February 1894, No. 15 N.A.

From J. Hannan, Esq., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, 15th June 1894, No. 127 E.I.

With reference to your Endorsement No. 2541 C. of 7th July 1893, I have the honour to submit, for sanction of Government and provision of funds, an estimate amounting to Rs. 5,300 for excavating a supply channel from Kattar river to Grimsa Eri tank, in Gudiyáttam taluk, North Arcot district.

2. This is a minor tank supplying the lands of Pakam and Pichanur villages and has an average cultivation of 152·46 acres, yielding a revenue of Rs. 984–6–1.

3. From the accompanying statements of revenue particulars it will be seen that remissions were granted during the last two years, amounting to Rs. 134–11–0, for want of water.

4. The report accompanying the estimate gives the required information of the work proposed to be carried out.

* * * * *

Enclosure.

Report to accompany the estimate for cutting a supply channel to Grimsa Eri tank.

This tank is a minor tank in charge of the Revenue Department (Revenue Survey No. 304) situated in Pakam village No. 81 about 3 miles north-east of Gudiyáttam town. The tank appears to have been constructed about eighty years ago by Mr. Greame, then Collector of the district, after whom the tank is named. The natural situation of the tank is good and, though the banks are badly aligned, is capable of enlargement at a small cost. The tank has somewhat silted up, but is now about thirteen feet deep at the deepest. The bund is at a uniform height and well revetted and requires no repair. The catchment area of the tanks is 14⅝ square miles, but it has been found totally incapable of irrigating the total ayacut area depending on it, which is made up as follows :—

	ACS.
In Pakam village	117·15
In Pichanur village	99·90
Add irrigation from two spring channels more or less dependent on the tank	147·96*
Total ...	375·01

* This area will not be taken into consideration in dealing with the tank and the ayacut area will be taken as 217 acres.

2. This area has seldom been fully cultivated, and during the last five years there have been heavy remissions (*vide* accompanying statement).

The average area cultivated is as follows:—

	ACS.
Pakam	63·77
Pichanur	88·69
Total ...	152·46

3. The inability of the large catchment area to supply enough water to the tank seems to be accounted for by the fact that the soil over the greater part of the area is exceedingly porous and that the run-off is very small. The whole area above and below the tank is studded with small spring channels which seem to absorb all the water which would otherwise go to the tank.

4. In order to increase the supply to the tank it is proposed to cut a supply channel from the Kattar river, a tributary of the Kavundiniyurnadi or Gudiyáttam river. This stream (the Kattar) has a catchment area of 64 square miles at the site of the proposed new channel. There are no observations to show how many days in the year we may expect to get water in the stream, but as a considerable portion of the area is situated in the slopes of the hills of the Palmanér taluk, a fair supply may be expected throughout the year. It is now proposed to excavate a channel capable of carrying 60 cubic feet per second to the tank. This will be done by making the channel with 19 feet bottom width, 2 feet depth of water, side slopes 1½ to 1 and fall in 3,000.

5. With this fall a length of channel of 7,065 feet only has to be excavated; beyond this the water may be allowed to pass into the tank by the natural drainage courses as shown on the survey plan and longitudinal section.

6. The soil throughout is easy and there is no jungle to be cleared. A sum of Rs. 500 is provided for compensation * to be paid for the small portion of cultivation and tope through which the channel will have to pass.

* Rs. 100 has now been allowed for demarcating the land.

7. The channel near its head passes through high ground, and there is no need for a head sluice.

8. The capacity of the Grimsa Eri is about 41 miles cubic feet and with the channel running full would be filled in about eight days.

9. The maximum surplus discharge of the tank with a coefficient of 500 is 3,000 cubic feet per second. It has a weir 65 feet long which is incapable of discharging the full quantity, but, as there is ample low ground beyond it over which water can pass, no extension of the weir is necessary.

10. The two streams shown in the survey and longitudinal section as crossing the channel are only small surface drains, the water from which can easily be carried in the channel as it is in deep cutting.

11. The spring channel near the tank will not be injured by the new channel passing close to it as it has a good bank and can be made quite safe.

12. The Sub-Divisional officer, Vellore, reports that if the above channel is excavated, 199 acres now classed as dry cultivation would be brought under wet. The total ayacut would then be existing ayacut 217 + 199 = 416 acres.

To bring a six months' crop to maturity over this area would require 90 miles cubic feet of water, that is, the tank would have to fill nearly about two and half times which is more than we can expect. The tank cannot be expected to fill more than two and half times in most years. It will afford enough water for 222 acres and the whole ayacut and an additional five acres can be cultivated. The return will then be as follows:—

	RS.
Difference between assessment and revenue realized (see statements) = 296 + 64 = ...	360
Add for five acres converted in wet	25
Total ...	385

or 6¼ per cent. on proposed outlay.

13. I consider this a very moderate estimate of the returns. In good years it will be possible to irrigate more than this area.

14. From inspection of the locality there seems no reason why the tank should not be enlarged and given a much greater supply by constructing an anicut across the Kattar for which there is a good site close to the proposed head of the channel.

15. It is however considered advisable to defer the investigation of this much larger scheme until it is seen how the channel now estimated for answers. The tank with its present improved supply should be transferred from the charge of the Revenue Department and brought on to the list of Imperial works.

To the Superintending Engineer, IV Circle, dated 25th June 1894, No. 54 N.A.
From „ „ „ „ 3rd November 1894, No. 251 E.I.
To „ „ „ „ 14th „ „ „ 107 N.A.
From „ „ „ „ 15th December „ „ 288 E.I.
To „ „ „ „ 8th January 1895, No. 2 N.A.
From „ „ „ „ 21st June 1895, No. 127 E.I.
To „ „ „ „ 5th July 1885, No. 49 N.A.
From „ „ „ „ 22nd October 1895, No. 237 I.

No. 226 I.

Submitted to Government. The estimate as now revised for the supply channel to the Grimsa Eri tank may be sanctioned.

2. It is recommended that the following addition be made to the list of "Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.," North Arcot district, communicated with G.O. No. 407 I., dated 6th July 1889 :—

Taluk.	Corresponding number on the map.	Source of supply.	Name of group or system.	Name of channel.	Name of tank.	Present irrigation.		Total.	
						Area.	Revenue.	Area.	Revenue.
						ACS.	RS.	ACS.	RS.
Gudiyáttam ..	23 A ..	Kattar river (a tributary of the Gudiyáttam river).	No anicut at head.	Supply channel to Grimsa Eri tank.	Grimsa Eri tank.	152	984	152	984

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

21st November 1895.

Order—No. 1030 I., dated 28th November 1895.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
North Arcot Division.
Original Works.

	RS.
Excavating a supply channel from Kattar river to Grimsa Eri tank, estimate	6,170

2. This sanction is registered as No. 149 I. of 1895–96.

3. The proposal made in paragraph 2 of the foregoing endorsement of the Chief Engineer for Irrigation is approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle, with plans and estimate.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 28th.

Recd. *Encl.*

G.O. No. 1030 I., 28th Nov. 1895.

NOVEMBER.

Channel

Estimate of Rs. 6,170 for excavating a supply — from Kattar river to Grimsa Eri tank, North Arcot district, sanctioned, and certain additions to the list of "Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.," for the district, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From J. E. PAUL, Esq., Executive Engineer, Gódávari Western Division, to the Superintending Engineer, I Circle, dated 11th November 1895, No. 394 S.

I have the honour to bring to your notice that an additional grant of Rs. 5,000 for agricultural repairs is urgently required for this division, and, if funds are available, a further grant under Agricultural Major Original.

2. Rupees 17,000 for agricultural repairs was the total grant given to this division for the current year; of this, Rs. 12,622 was spent in the Central delta before the separation of the two divisions, and Rs. 1,000 transferred to that division at the separation; thus only Rs. 3,378 remained for the Western division to cover the expenditure of the whole of the year.

3. Without this Rs. 5,000 can be granted, all works on river conservancy in this division including grass planting will have to be suspended. For example, as regards the Vasista, the reclamation of Kakaraparru set, which has been in progress for many years with marked success, the reclamation of Malleswaram set for which Mr. Young made use of floating groynes and recovered much land to the improvement of the river, the destruction of Koder Kharilanka, a serious obstacle to the river, the protection of Gangudupalem set now left incomplete, will all have to be discontinued.

4. As regards the Aghanda river, the formation of a secondary embankment, a very urgent work for the safety of the Railway and the delta and other important works which are now being investigated cannot be commenced.

5. I would also bring to your notice that, if it is possible, an additional grant of Rs. 5,000 should be given this year for the work "raising Vasista Gódávari right bank from anicut to Chinchinada, estimate Rs. 72,800," and Rs. 3,000 to complete "raising Vasista Gódávari right bank from Chinchinada ferry to Narsapur Rs. 8,300." Until the latter work is completed the Local Fund road, which runs on it, has to be closed for traffic.

6. These two works were designed to withstand a flood such as that of 1891 and were sanctioned in 1893. Hitherto it has not been possible to put these important works vigorously in hand on account of land not being handed over; a considerable portion of the land required has now been handed over and the Revenue officials are not now so dilatory as heretofore in the acquisition of land; it is, therefore, now possible to start the work in such a way that completion within three years will be a certainty.

7. I regret that I was not able to send this application with the second modification statement, as my office was in such a state of confusion that I could not get even the few figures I required, but this matter I have already brought to your notice.

No. 1886 G.D.

Copy submitted to the Chief Engineer for Irrigation for favour of arranging to allot additional funds under "Agricultural works" for the Gódávari Western Division as applied for by Mr. Paul in the foregoing letter.

(Signed) A. H. GARRETT,
Superintending Engineer, I Circle.

19th November 1895.

ORDER—No. 1031 I., dated 29th November 1895.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Agricultural Works.

From	RS.	*To* Gódávari Western Division.	RS.
Reserve—			
Repairs	13,000	Major Original Works	8,000
		Repairs	5,000
		Total ...	13,000

2. The following deferred telegram will be sent :—

To the Superintending Engineer, I Circle.

"Your No. 1886 G.D., 19th instant. Additional grants Rs. 8,000 and 5,000 for Agricultural Original Works and Repairs sanctioned. Please wire if more funds wanted."

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 29th.

Recd. *Encl.*

G.O. No. 1031 I., 29th Nov. 1895.

NOVEMBER.

Funds

Certain transfers of — for agricultural works in Gódávari Western Division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From J. H. MEDLICOTT, Esq., Executive Engineer, Madura Division, to the Superintending Engineer, VI Circle, dated 11th November 1895, No. 379 S.E.

I have the honour to request that an additional grant of Rs. 20,000 may be given under "49. Irrigation" to finish off the incomplete works. The outlay up to October 1895 against the present grant of Rs. 1,10,304 is Rs. 86,500.

No. 731 M.D.

Copy submitted to the Chief Engineer, Public Works Department, with a request that the additional grant applied for may be sanctioned in view to the incomplete works of the Periyár Project, in the Madura division, being finished.

TRICHINOPOLY,
14th November 1895.

(Signed) W. HUGHES,
Suptg. Engr., VI Circle.

Telegram from the Secretary to Government, Public Works Department, to the Superintendent of Works, No. I Periyár Division, dated 18th November 1895, No. 3547 C.

"Please wire if you can spare anything from current year's grant to provide Rs. 20,000 for Madura division under '49'."

Telegram from the Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyakulam, 21st November 1895.

Your telegram of 18th. Sorry. Nothing to spare.

Enclosure.

Statement to accompany application for an additional grant of Rs. 24,600 under "49. Capital Expenditure not charged to Revenue," for expenditure on the Periyár Project during 1895-96.

Amount of expenditure in the year for which sanction is asked.	Major and Minor heads under which expenditure will fall, with the amounts of sanctioned grants under each.	Probable expenditure in the whole year under the grants mentioned in column 2 if the expenditure in column 1 is sanctioned.	Major and Minor heads under which it is proposed to reduce the grants with the sanctioned grants under each.	Probable expenditure in the year under the heads mentioned in column 4.	Amounts by which it is proposed to reduce the grants under the heads mentioned in column 4.	Explanation, if no re-appropriation is considered possible; in such cases the urgency and necessity for the outlay must also be explained.
1	2	3	4	5	6	7
RS.	*49. Capital Expenditure not charged to Revenue.* Periyár Project.	RS.				
24,600	Rs. 6,44,000	6,68,600	*Nil.*	*Nil.*	*Nil.*	Required for the current year for finishing off the incomplete works of the Project in the Madura division.

(Signed) J. PENNYCUICK, Colonel, R.E.,
Chief Engineer, P.W.D.

Submitted to Government. As there are no funds available under "49. Capital Expenditure not charged to Revenue," it is recommended that an application be made to the Government of India for an additional grant, including the percentage charge for establishment, of Rs. 24,600.

2. The usual application is enclosed.

(Signed) J. PENNYCUICK, Colonel, R.E.,
Chief Engineer, P.W.D.

Order—No. $\frac{1031}{A}$ I., dated 29th November 1895.

The following deferred telegram will be sent:—

To the Secretary to the Government of India.

"Additional grant Rs. 24,600 required this year under '49' for finishing off Periyár incomplete works in Madura division. Please wire sanction."

[Here enter No. $\frac{1031}{B}$ I., dated 29th November 1895.]

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, VI Circle.
„ Examiner, Public Works Accounts.

ENDORSEMENT—No. $\frac{1031}{B}$ I., dated 29th November 1895.

Forwarded.

(By order.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Secretary to the Government of India,
Public Works Department.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 29th.

Recd. *Encl.*

G.O. Nos. $\frac{1031}{A}$, $\frac{1031}{B}$ I., 29th November 1895.

NOVEMBER.

Funds

Forwarding Proceedings directing that a telegram be sent to the Government of India requesting sanction, by wire, to an additional grant of Rs. 24,600 required this year under "49" for finishing off the Periyár incomplete works in Madura division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From the Superintending Engineer, III Circle, dated 20th November 1895, No. 2646.
" " " V " " 17th " " " 369 E.I.

No. 229 I.

Note by the Chief Engineer for Irrigation.

The following transfers of funds are recommended for sanction :—

Irrigation.
43. Minor Works and Navigation.

From

Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Ordinary Works.
Bellary Division.
Major Original Works.

Royalcheruvu tank—	RS.	RS.
Improvements	1,000	
Repairs	2,000	
	3,000	
Establishment	690	
Tools and plant	45	
		3,735
Agricultural Works.		
Reserve—		
Repairs	1,446	
Establishment	332	
Tools and plant	22	
		1,800
Total ...		5,535

To

Minor Works for which Capital and Revenue Accounts are kept.
Tirukkóyilûr Anicut System.
Revenue Account.

South Arcot Division—	RS.	RS.
Extensions and improvements	500	
Maintenance and repairs ...	4,000	
		4,500
Establishment		1,035
Total ...		5,535

2. There are no funds available to meet the demand for an additional allotment aggregating Rs. 273 for the Cuddapah and Kurnool divisions under "Minor Works, Revenue Department."

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

27th November 1895.

Order—No. 1034 I., dated 29th November 1895.

The transfers of funds recommended by the Chief Engineer for Irrigation are sanctioned.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, III Circle.
" " " V "
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1895} Madras.

PUBLIC WORKS.

Dated November, 29th.

Recd. *Encl.*

G.O. No. 1034 I., 29th Nov. 1895.

NOVEMBER.

Funds

The transfers of — recommended by the Chief Engineer for Irrigation for works in South Arcot division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

TABULAR STATEMENT OF MISCELLANEOUS PROCEEDINGS AND MATTERS OF ROUTINE,

IRRIGATION,

FOR THE MONTH OF NOVEMBER 1895.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Discharges of rivers, &c.—Letter from the Government of Bengal forwarding copies of a memorandum on the different methods of ascertaining the — and on the discharges of orifices and over-falls and the flow of water in pipes, communicated to Superintending Engineers.	1st Nov. 1895, No. 911 I.	......
Letter to the Government of Bengal acknowledging receipt of the copies.	1st do. do. No. 912 I.	......
Road.—Proceedings, Local and Municipal Department, communicating letter from the President, District Board, Salem, stating that the Board has resolved to accept the offer of Government to defray one-third of the cost of putting the Tiruppattúr tank bund road into order, communicated to the Chief Engineer for Irrigation.	1st do. do. No. 913 I.	25th Sept. 1895, No. 789 I.
Land.—The temporary occupation of certain — for storage of materials for repairing the Vridha Gowtami under-tunnel, Gódávari district, authorized.	1st do. do. No. 914 I.	......
Land.—Notifications for the acquisition of — required for certain works of the Kistna delta system, ordered to be published in the *Fort St. George Gazette*.	1st do. do. No. 915 I.	......
Land.—Notifications for the acquisition of — required for certain works in Nellore district, ordered to be published in the *Fort St. George Gazette*.	1st do. do. No. 916 I.	......
Inspection Notes.—The — of Mr. A. H. Garrett, Superintending Engineer, I Circle, of the 3rd and 4th October 1895, recorded with remark.	2nd do. do. No. 924 I.	16th Nov. 1894, Nos. 902–3 I.
Land.—Notification for the acquisition of certain — already taken up for diverting the course of a *vagu* in Kurnool district, ordered to be published in the *Fort St. George Gazette*.	2nd do. do. No. 925 I.	......
Land.—Notification for the acquisition of — required for repairing Rayakudum drain in Gódávari district, ordered to be published in the *Fort St. George Gazette*.	4th do. do. No. 927 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—The temporary occupation of certain — required for raising the Kistna Left embankment at Devarapalli, Kistna district, authorized. and the notification already published for acquisition of certain lands, cancelled.	4th Nov. 1895, No. 928 I.	......
Land.—Notification for the acquisition of — for the construction of a head sluice to Damarama channel, Ganjám district, ordered to be published in the *Fort St. George Gazette.*	4th do. do. No. 929 I.	......
Land.—Notification for the acquisition of — required for works in Kistna delta system, ordered to be published in the *Fort St. George Gazette.*	5th do. do. No. 931 I.	......
Funds.—Certain deficiency in the provision of — for the estimate sanctioned in G.O., No. 770 I., dated 20th September 1895, provided for.	5th do. do. No. 932 I.	......
"*Control*" *sluices.*—Government of India letter forwarding a copy of a catalogue relating to Mr. F. G. M. Stoney's — for the control of rivers, canals, irrigation, &c., communicated to the Chief Engineer for Irrigation and Superintending Engineers.	8th do. do. No. 943 I.	......
Letter to the Government of India acknowledging receipt of the above.	8th do. do. No. 944 I.	......
Objectionable items.—Orders on statement of — in the accounts of No. I Periyár division for August 1895.	11th do. do. No. 947 I.	28th Oct. 1895, No. 875 I. 9th May 1895, No. 398 I. 1st Aug. 1895, No. 602 I. 6th Aug. 1895, No. 616 I.
Land.—Notification for the acquisition of — required for the Kistna delta system, ordered to be published in the *Fort St. George Gazette.*	11th do. do. No. 950 I.	......
Land.—Notification for the acquisition of — required for the Pennér Left flood bank, Buckingham Canal, Nellore district, ordered to be published in the *Fort. St. George Gazette.*	11th do. do. No. 951 I.	......
Land.—Notification for the acquisition of — required in connection with clearance of silt in the bed of Damarama channel, Ganjám district, ordered to be published in the *Fort St. George Gazette.*	11th do. do. No. 952 I.	......
Land.—Notification for the acquisition of — required for improvements to the Reddivalam channel, North Arcot district, ordered to be published in the *Fort St. George Gazette.*	11th do. do. No. 953 I.	......
Land.—Notification for the acquisition of — for certain irrigation work in Madura district, ordered to be published in the *Fort St. George Gazette.*	11th do. do. No. 954 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Moosi flood bank.—Proceedings, Judicial Department, approving the proposals of the Inspector-General of Police for the establishment of a punitive force to guard the —, Nellore district, during certain months of the year, communicated to the Superintending Engineer, II Circle.	12th Nov. 1895, No. 955 I.	4th March 1895, No. 811 C. 28th Feb. 1895, No. 203 I. 12th April 1893, No. 348 I. 24th Sept. 1891, No. 2571 W.
Land.—Notification for the acquisition of — for banking the old Coleroon in South Arcot district, ordered to be published in the *Fort St. George Gazette*, and the temporary occupation of certain land for stacking materials, authorized.	12th do. do. No. 958 I.	......
Land.—Notifications for the acquisition of — required for the Kistna delta system, ordered to be published in the *Fort St. George Gazette*.	12th do. do. No. 959 I.	......
Vellur Hissa tank.—The Superintending Engineer, IV Circle, directed to take steps at once to have the crest of the weir of the —, lowered without awaiting the formal transfer of the tank to the Public Works Department.	12th do. do. No. 962 I.	......
Objectionable items.—Orders on statement of — in the accounts of Executive Engineers remaining unremedied to end of July 1895, II Circle.	12th do. do. No. 963 I.	16th Oct. 1895, No. 842 I. 20th Sept. 1895, No. 775 I. 22nd Aug. 1895, No. 675 I.
Land.—Notification for the acquisition of — required for certain irrigation work in Tanjore district, ordered to be published in the *Fort St. George Gazette*.	12th do. do. No. 964 I.	......
Kurnool-Cuddapah canal.—The Cuddapah District Association referred to G.O., No. 307 I., dated 25th March 1892, regarding the proposal for excavating certain channel from the —.	13th do. do. No. 965 I.	25th March 1892, No. 307 I. 13th May 1889, No. 231 I.
Rate of interest.—Ordered that the Government of India be requested to state whether the — chargeable on the capital outlay of Major (Productive Works) prescribed in paragraph 349, chapter III, volume II, Public Works Code, is intended to be reduced from 4 to $3\frac{1}{2}$ per cent.	14th do. do. No. 966 I.	......
The Government of India addressed	14th do. do. No. 967 I.	......
Objectionable items.—Orders on statement of — in the accounts of Executive Engineers remaining unremedied to end of July 1895, III Circle.	14th do. do. No. 968 I.	24th Oct. 1895, No. 861 I. 20th Sept. 1895, No. 774 I.
Funds.—The net excess outlay of Rs. 2,005 incurred under Tools and Plant in No. I Periyár division, ordered to be met from the balance of the amount placed at the disposal of the Superintendent of Works under "Tools and Plant."	15th do. do. No. 972 I.	6th Aug. 1895, No. 616 I.
Change of name.—The — of a certain pump bought for the Sagiléru project from "Contractor's pump" to "Hand Holman's pump," sanctioned.	15th do. do. No. 975 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Floods.—Proceedings, Revenue Department, approving the Board's recommendation that in view of the damage caused by the recent —, the ryots of certain taluks of the Gódávari district be permitted without restriction as to date, to apply for water for the second-crop this year, communicated to Superintending Engineers, I and II Circles.	15th Nov. 1895, No. 976 I.	......
Objectionable items.—Orders on statement of — in the accounts of Executive Engineers remaining unremedied to end of July 1895, IV Circle.	16th do. do. No. 981 I.	24th Oct. 1895, No. 862 I. 24th Sept. 1895, No. 787 I. 20th Aug. 1895, No. 672 I. 6th Aug. 1895, No. 619 I.
Land.—Notification for the acquisition of — required for restoring the Goparaju channel, Vizagapatam district, ordered to be published in *Fort St. George Gazette.*	18th do. do. No. 984 I.	......
Land.—Notification for the acquisition of—required in connection with the Muniyeru project in Kistna district, ordered to be published in *Fort St. George Gazette.*	18th do. do. No. 985 I.	12th Dec. 1893, No. 1089 I.
Irrigation Cess Fund.—Proceedings, Revenue Department, sanctioning the proposals of the Collector of Salem for utilizing the surplus balance to the credit of the —, communicated to officers concerned.	18th do. do. No. 986 I.	13th Feb. 1894, No. 121 I.
Objectionable items.—Orders on statement of — in the accounts of Executive Engineers remaining unremedied to end of July 1895, V Circle.	19th do. do. No. 987 I.	23rd Oct. 1895, No. 853 I 20th Sept. 1895, No. 777 I. 14th Aug. 1895, No. 655 I. 12th June 1895, No. 484 I.
Charts of the Gódávari river.—Government of India letter returning with remark the —, recorded.	19th do. do. No. 988 I.	28th Jan. 1895, Nos. 78–79 I. 10th Jan. 1895, No. 37 I. 12th Feb. 1895, No. 532 C. 30th Jan. 1895, No. 334 C.
Channel.—Proceedings, Revenue Department, sanctioning the repair of a spring — in Polur taluk, North Arcot district, recorded.	19th do. do. No. 989 I.	23rd Oct. 1895, No. 3062 C.
Native Chamber of Commerce.—The — at Cocanada informed that the revised navigation rules on the Ellore canal are still under consideration.	19th do. do. No. 993 I.	......
Land.—Notification for the acquisition of — required for the Rushikulya works in Ganjám district, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. 995 I.	......
Objectionable items.—Orders on statement of — in the accounts of Executive Engineers remaining unremedied to end of July 1895, VI Circle.	20th do. do. No. 996 I.	23rd Oct. 1895, No. 854 I. 26th Sept. 1895, No. 791 I.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Explosives.—The cost of the —, Rs. 673-10-0, stolen from the Periyár magazine, ordered to be written off by debit to the main dam.	20th Nov. 1895, No. 997 I.	20th March 1895, No. 266 I. 13th Feb. 1895, Nos. 129-30 I. 31st Jan. 1895, No. 93 I. 14th March 1894, No. 734 I. 12th June 1895, No. 1405 W.
Buckingham Canal.—Letter from the Superintending Engineer, II Circle, reporting that there are no river flood banks along the line of the — which should be abandoned, recorded.	21st do. do. No. 1001 I.	12th Nov. 1895, No. 955 I. 4th March 1895, No. 811 C. 28th Feb. 1895, No. 203 I. 17th April 1893, No. 348 I.
Contribution work.—The execution by the Public Works Department of the — "Cutstone coping to the crest of the division dam to Sivaneri and Pudukulam tanks," Tinnevelly division, sanctioned.	21st do. do. No. 1004 I.	......
Land.—Notification for the acquisition of — required for the Rushikulya works in Ganjám district, ordered to be published in *Fort St. George Gazette.*	22nd do. do. No. 1005 I.	......
Land.—Notification for the acquisition of — required for improving the Dimila channel and its branches, Vizagapatam district, ordered to be published in *Fort St. George Gazette.*	22nd do. do. No. 1006 I.	......
Land.—Notification for the acquisition of — required for a flood bank above the head sluice of Pudukkóttai-Periyakulam, Tinnevelly district, ordered to be published in *Fort St. George Gazette.*	22nd do. do. No. 1007 I.	......
Objectionable items.—Orders on statement of — in the accounts of Executive Engineers remaining unremedied to end of July 1895, I Circle.	22nd do. do. No. 1008 I.	16th Oct. 1895, No. 843 I. 27th Aug. 1895, No. 693 I. 6th Aug. 1895, No. 617 I. 20th Sept. 1895, No. 776 I.
Periyár project.—E. Form Progress reports of No. I Periyár and Madura (No. II Periyár) divisions for October 1895, ordered to be forwarded to the Government of India.	23rd do. do. No. 1009 I.	......
Forwarded	23rd do. do. No. 1010 I.	......
Land.—Notification for the acquisition of — required for the Rushikulya works in Ganjám district, ordered to be published in *Fort St. George Gazette.*	23rd do. do. No. 1011 I.	10th Jan. 1894, Nos. 13-14 I.
Land.—Notification for the acquisition of — required for excavating Vennalacodu, a branch of the Pulleru canal, Kistna Eastern delta, ordered to be published in *Fort St. George Gazette.*	23rd do. do. No. 1012 I.	22nd Sept. 1893, No. 824 I.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—Notification for the acquisition of — required for the improvement of the Esayanur channel, North Arcot district, ordered to be published in *Fort St. George Gazette.*	23rd Nov. 1895, No. 1013 I.	......
Water-rate.—Proceedings, Local and Municipal Department, informing the Chairman, Municipal Council, Masulipatam, that the council will not be required to meet any annual charge for water supplied further than the sum of Rs. 1,364 already being paid as interest on the cost of the present works, communicated to Superintending Engineer, II Circle.	23rd do. do. No. 1015 I.	19th Oct. 1894, No. 780 I. 24th Aug. 1894, No. 2766 C. 3rd July 1894, No. 1657 W.
Land.—Notification for the acquisition of — required for the improvement of the Buckingham canal in Nellore district, ordered to be published in *Fort St. George Gazette.*	25th do. do. No. 1016 I.	......
Land.—Notification for the acquisition of — required for extending the Muthencodu channel, Gódávari district, ordered to be published in *Fort St. George Gazette.*	25th do. do. No. 1017 I.	......
Kurnool-Cuddapah canal.—Proceedings, Revenue Department, agreeing with the Board of Revenue in its interpretation of the block rules relating to the —, communicated to Superintending Engineer, III Circle.	25th do. do. No. 1018 I.	......
Steam Launch "Alexandria."—The inspection of the Public Works Department — at Bezwada by Mr. A. E. Taylor, an Engineer of the Royal Indian Marine, sanctioned.	25th do. do. No. 1019 I.	......
Unauthorised appropriations.—Orders on statement of — made during October 1895 under Irrigation, 43. Minor Works and Navigation.	29th do. do. No. 1032 I.	30th Oct. 1895, Nos. 895–96 I.
The above forwarded to the Accountant-General, Public Works Department.	29th do. do. No 1033 I.	......

PWD
1896